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A MONTHLY JOURNAL OF DENTISTRY.

DEVOTED TO

THE INTERESTS OF THE PROFESSION.

EDITED BY

J. TAFT, D.D.S.

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# INDEX TO VOLUME XLVIII.

PAGE

## COMMUNICATIONS.

Abscess of the Maxillary Sinus—Treatment of, by Dr. E. Lecaudey ....... 9
Aconite and Iodine in Pericementitis, by W. I. Jones, D.D.S ....... 191
Address—Abstract of, by A. E. Baldwin, M.D., D.D.S ....... 125
Address, by Dr. T. M. Allen ... 417
Address, by Dr. E. P. Beadles. 435
Address, by Dr. J. D. Patterson 489
Address on the Work of the Executive Committee of the World's Columbian Dental Congress, by J. Taft, D.D.S ....... 55
Aluminum, by Dr. Thos. P. Hinman ....... 429
Aluminum Cast, by Dr. Harper 451
Anæsthetics—Local, by L. E. Custer, D D.S ....... 527
Anæsthetizing Sensitive Dentine, by W. H. Van Deman, D.D.S ....... 383
Anterior Fillings, by E. P. Beadles, D.D.S ....... 478
Anterior Teeth—Fractures of, by Dr. Geo. W. Whitefield 13
Articulation of Artificial Teeth—Some Points on the, by G. Molyneaux, D.D.S. 127, 273
Articulators, by Dr. H. E. Belden ....... 473
Bichloride of Mercury, by Carrie M. Stewart, D.D.S ....... 8
Bite—Method of Taking the, by Dr. J. A. Frazier ....... 423
Bridge-Work by A. W. Haidle, D.D.S ....... 576
Boracine—Tetraborate of Soda, by Mr. Denis ....... 10
Care of Children's Teeth—Ignorance and Negligence of Parents in the, by Dr. J D. Adair ....... 426

PAGE

Care of Infants' Teeth, by Dr. W. H. Morrison ....... 487
Cavities—Varnishing, by Dr. W. G. Browne ....... 487
Children—The Teeth of, by Howard Van Antwerp, D.D.S ....... 92
Chloroform Anæsthesia without Danger, by F. H. Pritchard, M.D ....... 516
Chloroform as an Obtundent—Method of Using, by Dr. A. C. Hewitt ....... 541
Chloroform and Ether, by C. G. Darling, M.D, ....... 313
Chemistry—Physiological and Therapeutics, by Dr. O. C. Farish ....... 424
Cleft Palate Operation, by Mr. Davies-Colley ....... 302
Clinics ....... 543
Cocaine, by Arthur R. Cushny, A.M., M.D ....... 334
Contour Filling made in the Laboratory—Some of the Merits, by Dr. T.W. Foster ....... 479
Crown and Bridge-Work Prudence and Gutta-Percha, by Dr. Geo. V. I. Brown.. 23
Crown—An Original, by Dr. J. H. Crossland ....... 431
Demonstrations at the World's Columbian Dental Congress ....... 70
Dental Caries—Etiology of, by Dr. S. B. Palmer ....... 561 578
Dental Caries—Relation to Certain Forms of Indigestion, by E. F. Wilson, M.D ....... 78
Dental Caries and Some Popular Fallacies, by Dr. Geo. J. Fredericks ....... 540
Dental Education, by Dr. I. N. Carr ....... 443
Dental Education—Report, by Dr. L. Ottofy ....... 498

PAGE

Dental Exostosis, by Mary Linde, D.D.S.................. 269

Dental Legislation, by Dr. H. B. Noble...................... 444

Dental Legislation, by Dr. A. W. Sweeney.................... 445

Dental Protective Association—Report of, by Dr. J. N. Crouse....................492, 549

Dentistry as a Specialty of Medicine, by Dr. R. A. Rush........................ 432

Dentistry—What Relation Shall it Hold to Medicine—Discussion ................ 54

Dentistry—Past, Present and Future, by Dr. T. J. Watson ........................... 431

Dentistry Among the Speechless, by Charlotte E. Benton, D.D.S..................... 573

Diseases of the Palate, by Vida A. Latham, D.D.S.......... 6

Diseases of the Maxillary Bones and their Periosteum, by Vida A. Latham ......................157, 223, 261

Dyspepsia, by Hugh M. Patton, M.D......................... 145

Early Women in Dentistry, by Lucy Hobbs Taylor........ 31

Education—Dental, by Dr. I. N. Carr......................... 443

Education—Dental, Report by Dr. L. Ottofy................. 498

Electricity and Painless Dentistry, by L. E. Custer, B.S., D.D.S...................... 394

Empyema of the Maxillary Sinus, by M. H. Fletcher, M.D., D.D.S.................. 105

Enamel—Development of, by Dr. R. R. Andrews......... 58

Enemies of the Human Teeth, by A. Benson, M.D., D D.S. 164

English Tube Teeth, by John Girdwood, L.D.S............ 1

Ethics, Discussion of............ 429

Extraction of the Trigeminal Nerve, by Dr. T. W. Brophy 582

Executive Committee of the World's Columbian Dental Congress—Work of the, by J. Taft, D.D.S...... 55

PAGE

Exhibits at the World's Columbian Dental Congress...... 66

Experiments with Bichloride of Mercury, by Carrie M. Stewart, D.D.S............... 8

Exostosis—Indications of Dental, by Mary Linde......... 269

Fractures of the Anterior Teeth—Conservative Method of Treatment, by Dr. Geo. W. Whitefield ............... 13

Fillings—Anterior, by Dr. E. P. Beadles... .... ........... 478

Filling—Some of the Merits of a Contour Filling, by Dr. T. W. Foster.................. 479

Harris Memorial, Chapin A... 548

Hygiene in Prosthetic Dentistry, by Dr. John A. Daly. 476

Hygiene—Report of, by Dr. W. E. Walker................. 538

Hygiene—Oral, by Dr. R. R. Freeman......................... 539

Hypnotic Suggestion as a Dental Obtundent and Sedative, by Dr. Thos. Fillebrown ......................... 3

Hypnotism, by Prof. Geo. H. Mead ......................... 380

Infection from the Mouth, by L. E. Clifford, D.D.S..194, 209

Inferior Maxilla—What Neoplasms Necessitate the Excision of the—Discussion. 11

Inter-Articulation — Some Facts Showing the Relationship of, by L. Van Orden, M.D...................... 7

Indigestion—Relation of Dental Caries to, by E. F. Wilson, M.D...................... 78

Ignorance and Negligence of Parents in the Care of Children's Teeth, by Dr. J. D. Adair......................... 426

Jaws—A Study of the Masticating Force, by Dr. Geo. J. Dennis...................... 26

Jaws and Teeth—Some of the Forces that Influence the Form of the, by Dr. W. X. Sudduth...................... 59

Kalium—Natrium, Method of using, by Dr. J. D. Adair. 420

PAGE

Local Anæsthetics, by L. E. Custer, D.D.S.................. 527

Local Obtundents, by A. W. Haidle, D.D.S.................. 338

Logan Crown—Method of Securing a Perfect Adaptation of, by Dr. T. P. Hinman.............................. 419

Logan Crown—Simple Method of Banding, by Dr. T. P. Hinman........................ 470

Luxation or the Immediate Method in the Treatment of Irregular Teeth, by Dr. Geo. Cunningham......... 65

Masticating Force of the Jaws. by Dr. Geo. J. Dennis..... 26

Maxillary Bones and their Periosteum—Diseases of, by Vida A. Latham, D.D.S ........................157, 223, 261

Maxillary Sinus—Abscess of, by Dr. E. Lecaudey......... 9

Maxillary Sinus—Empyema of, by M. H. Fletcher, M.D., D.D.S.................... 105

Medicine—What Relation shall Dentistry Hold to—Discussion...................... 54

Medicine—Dentistry as a Specialty of, by Dr. R. A. Rush................................ 432

Mouth—Infection from the, by E. L. Clifford, D.D.S. ............................194, 209

Nerve—Extraction of the Trigeminal by Dr. T. W. Brophy.............................. 582

Nitrous Oxide, by J. Lathrop, Jr., D.D.S..................... 320

Nomenclature—Correct, by Dr. Merrill........................ 424

Nomenclature—Report by Dr. S. H. Guilford................ 550

Oral Hygiene, by Dr. R. R. Freeman........................ 539

Oral Therapeutics—Practical, by Dr. Geo. V. Brown, M.D............................ 172

Operative Technics, by Dr. D. M. Cattell...................... 15

Orthodontia—An Interesting Case in, by Dr. W. G. Browne........................ 422

PAGE

Obtundents—Local, by A. W. Haidle, D.D.S................. 338

Oxyphosphate of Copper, by Dr. W. V. B. Ames......... 485

Pathology—Case in by Dr. Gaskell........................ 588

Plate Retainer, by Wm. H. Steele, D.D.S.................. 143

Planting Teeth by Dr. Wm. N. Morrison........................ 583

Platinum—A new Practical Way of Fusing, by L. E. Custer, D.D.S................... 90

Persistent Vitality, by F. O. Jacobs, D.D.S................ 399

Pericementitis—Aconite and Iodine in, by W. I. Jones, D.D.S.......................... 191

Porcelain Teeth—An Original Method of Protecting the Tips, by Dr. Thos. P. Hinman................................ 469

Porcelain Work, by J. H. Downie, D.D.S................ 532

Prosthetic Dentistry—Demonstrations........................ 494

Prosthetic Dentistry—Hygiene in, by Dr. John A. Daly.............................. 476

Prosthetic Dentistry—Two Useful Ideas in, by Dr. L. G. Noel........................ 474

Prosthetics — Unprofessional, by Dr. G. N. Johnson...... 475

Prudence and Gutta-Percha, by Dr. Geo. V. I. Brown.. 23

Pulp-Canal—Some Changes that Take Place in and Around, by Dr. D. E. Caush.............................. 61

Pulps—Devitalization of, by C. M. Wright, D.D.S...... 82

Pulp—Devitalization of Dental, by A. W. Diack, D.D.S 218

Physiological Chemistry and Therapeutics, by Dr. O. C. Farish........................ 424

Pyorrhœa Alveolaris — The Etiological Classification of, by Dr. M. L. Rhein.... 552

Reforms, by Sigel Roush, A.M., M.D., D.D.S.................. 187

Restoratives and Resuscitants, by N. S. Hoff, D.D.S....... 365

PAGE

Root Canals—Sulphuric Acid for opening, by J. R. Callahan, D.D.S. .......... 73
Root Filling, by Harry Baldwin, L.D.S. .......... 242
Rubber—Vulcanizing, by Dr. Geo. B. Snow .......... 599
Sensitive Dentine—Anæsthetizing, by W. H. Van Deman, D.D.S. .......... 385
Soda—Tetraborate of, by Mr. Denis .......... 10
Some Facts Showing the Relationship of the Inter-Articulation, by L. Van Orden, M.D. .......... 7
Some of the Forces that Influence the Form of the Jaws and Teeth during the Process of Development, by Dr. W. X. Sudduth .......... 59
Sulphuric Acid for Opening Root Canals, by J. R. Callahan, D.D.S. .......... 73
Surgical Engine, The, by Dr. W. G. A. Bonwill .......... 456
Syphilis, by W. H. Whitslar, M.D., D.D.S. .......... 521
Systemic Medication in Dental Practice, by Edgar Palmer, D.D.S. .......... 116
Technics—Operative, by Dr. D. M. Cattell .......... 15
Teeth—Appliance for Regulating, by J. F. Steele, D.D.S. .......... 205
Teeth—Articulation of Artificial, by G. Molyneaux, D.D.S. .......... 127, 273
Teeth—Care of Infants', by Dr. W. H. Morrison .......... 487
Teeth of Children, by Howard Van Antwerp, D.D.S. .......... 92
Teeth—Enemies of the Human, by A. M. Benson, M.D., D.D.S. .......... 164
Teeth—Etiology of the Irregularity and Crowding of the, by Dr. C. L. Boyd .......... 431
Teeth—Ignorance and Negligence of Parents in the Care of Children's, by Dr. J. D. Adair .......... 426

PAGE

Teeth—Luxation in the Treatment of Irregular, by Dr. Geo. Cunningham .......... 65
Teeth—Planting, by Dr. Wm. N. Morrison .......... 583
Therapeutics of Aconite and Iodine in Pericementitis, by W. I. Jones, D.D.S. .......... 191
Therapeutics—Practical Oral, by Geo. V. Brown, M.D. .......... 172
Therapeutics—Physiological, Chemistry and, by Dr. O. C. Farish .......... 424
Varnishing Cavities, by Dr. W. G. Browne .......... 487
"Vis Medicatrix Naturæ," by W. H. Whitslar, M.D., D.D.S. .......... 86
Vitality—Persistent, by F. O. Jacobs, D.D.S. .......... 399
Vulcanizing Rubber, by Dr. Geo. B. Snow .......... 599
What Neoplasms Necessitate the Excision of the Inferior Maxilla—Discussion .......... 11
World's Columbian Dental Congress—Report of Treasurer .......... 493

## SOCIETY PROCEEDINGS.

Alabama Dental Association .......... 417
American Dental Association .......... 489, 550, 578
American Dental Protective Association—Report of .......... 549
Mississippi Board of Dental Examiners .......... 253
Mississippi Valley Dental Association .......... 206
National Association of Dental Faculties .......... 506
National Association of Dental Examiners .......... 564
Southern Dental Association .......... 434, 469, 538
Woman's Dental Association of the United States .......... 28
World's Columbian Dental Congress .......... 1, 53
World's Columbian Dental Congress—Report of .......... 493

## SELECTIONS.

PAGE
Amyl Nitrite.................... 410
Anæsthesia—Semi-Centennial of the Discovery............ 607
A Curious Case.................... 409
Bacterial Pathology ............. 606
Bled to Death from Tooth Extraction.......................... 605
Breath—Offensive Odor of...... 299
Bicycle Riding...................... 146
Biology—Origin and Meaning of the Term.................... 45
Bismuth in Solution............. 410
Blood Corpuscles—Origin of Red.............................. 609
Can Women Farm?............... 304
Clark—Sir Andrew, A Reminiscence of...................... 300
Chemistry—Synthetical, Its Relation to the Materia Medica of the Future...... 293
Cleft Palate—Improved Operation, by Mr. Davies-Colley............................ 302
Cocaine Anæsthesia—Rendered Harmless.................... 606
Cocaine for Local Anæsthesia. 611
Cocaine—Use of.................. 43
Cocaine—In Surgical Operations—Indications for...... 408
Cocaine—Test...................... 222
Cold—How to avoid Taking... 38
Chloroform Anæsthesia without Danger...................... 516
Chloroform for External Hemorrhage...................... 272
Chloroform Narcosis............ 607
Damages for Extracting a Sound Tooth..................... 279
Dentistry in China................ 42
Dentition—Illnesses Ascribed to.................................. 241
Denture—Successful Removal from the Œsophagus...... 409
Diarrhœa of Dentition—Treatment.............................. 272
Disease—Prevention of........... 305
Dunn Syringe...................... 537
Dyspepsia—Importance of..... 145
Every Man to His Trade....... 488
Food Hygiene...................... 201
Food Values—A Table of...... 147
PAGE
Glass Eyes—Price of............ 306
Gastric Intestinal Affections... 148
Healthiest Capital in the World.............................. 518
Kimber—Diana Clifford........ 72
Lepers—A Hospital of.......... 292
Longevity, by Dr. D. E. Nelson, M.D........................ 280
Longevity—Increasing......... 299
Medicine—The International Congress of.................... 292
Mind and Weather, The........ 199
Milk—Absorption of Odors by 609
Morphine Poisoning—Potassium Permanganate in..... 608
Œsophagus—Successful Removal of a Denture from the.............................. 409
Patent Medicines................. 609
Quack—Squelching a............ 144
Reminiscence of Sir Andrew Clark.............................. 300
Reynolds—Dr. Annie Felton.. 124
Right-Sightedness and Left-Sightedness....................... 356
Root Filling......................... 242
Sensitive Dentine—Obtundent 410
Spectacles—Superfluous......... 149
Scurvy in Children................ 297
Sugar—Value of and Effect of Smoking on Muscular Work............................. 515
Surgical Engine—The........... 456
Squelching a Quack.............. 144
Synthetical Chemistry—Its Relation to the Materia Medica of the Future....... 293
Syphilis—Diagnosis of Hereditary............................. 43
Tait—Dr. Lawson........ ...146, 606
The Tongue in Disease.......... 604
Trional................................ 163
Title of Professor—The......... 518
Value of Sugar and Effect of Smoking on Muscular Work............................. 515
Voice—The Influence of Odors on the.............................. 304
What Caused Death.............. 410
What Shall we Eat............... 459
Weather and the Mind—The.. 199
Woman's Health Protective Association...................... 149
Woman Honored—Another... 612

PAGE
Women as Sanitary Inspectors. 612
What Patients tell Experts—Rules Concerning.......... 612
Why are we Weary.............. 513

COLLEGE COMMENCEMENTS

American College of Dental Surgery...................... 230
Atlanta Dental College......... 239
Baltimore College of Dental Surgery ...................... 232
Birmingham Dental College... 359
Boston Dental College........... 462
Chicago College of Dental Surgery......................... 412
Cincinnati College of Dental Surgery........................ 235
Cleveland University of Medicine and Surgery, Dental Department.................. 237
Columbian University, Dental Department ................. 361
Harvard University, Dental Department................... 414
Indiana Dental College......... 232
Kansas City Dental College.... 236
Meharry Medical College, Dental Department.............. 235
Missouri Dental College........ 239
National University, Dental Department................... 358
New York College of Dentistry 233
Northwestern University Dental School..................... 412
Ohio College of Dental Surgery.............................. 231
Ohio Medical University, Department of Dentistry.. 236
Pennsylvania College of Dental Surgery.................... 238
Philadelphia Dental College... 233
Royal College of Dental Surgeons of Ontario............. 230
Southern Medical College, Dental Department........ 359
University of Buffalo, Dental Department................. 413
University of California, College of Dentistry............ 413
University of Denver, Dental Department................... 240
University of Iowa, Dental Department..................... 237

PAGE
University of Maryland, Department of Dental Surgery.............................. 234
University of Michigan, College of Dental Surgery.... 360
University of Minnesota, Dental Department.............. 411
University of Pennsylvania, Department of Dentistry. 359
Vanderbilt University, Dental Department.................... 241
Western Dental College......... 240
Western Reserve University, Dental Department......... 236

EDITORIAL.

American Dental Association. ..............................310, 362
American Medical Association 102
An Interesting Case.............. 47
An Inquiry.......................... 47
Care of the Mouth and Teeth. 152
Degree—A New.................. 100
Dental College—A New........ 364
Dental Colleges—Opening...... 571
Dental Journal—A New........ 613
Dental Law of Ohio—Change in.................................. 309
Dentistry in Court................ 156
Editorial Retirement............ 103
Mississippi Valley Dental Society..........................50, 613
National Association of Dental Faculties.................. 363
National Meetings at Old Point Comfort....................... 465
Ohio State Dental Society, 49, 570
Professional Card—A........... 311
Professional Ethics............... 363
Retirement.......................... 103
Removal.............................. 364
San Francisco Dental Society. 154
Shelley—Dr. Henry.............. 312
Southern Dental Association.. 364
Teeth—Care of the Mouth and 152
Tri-State Dental Meeting, 154, 520
Union.................................. 569
Wells' Memorial................... 468

NOTICES.

Alabama Dental Association.. 151
American Dental Society of Europe..............362, 414, 569

PAGE

American Medical Association—Dental Section.......151, 250
Alumni Reunion.................. 415
Chicago Dental Society......... 251
Connecticut State Dental Association.......................... 416
East Tennessee Dental Association.................. ............ 462
Illinois State Dental Society. ......... ....... ...........150, 308
Indiana State Dental Society.. 308
Iowa and Nebraska State Dental Societies—Joint Meeting.............................. 203
Kentucky State Dental Association.......................... 307
Midwinter Fair—Dental Congress.......................... .. 251
National Association of Dental Faculties...................... 363
New England Dental Society.. 519
New York State Dental Society 252
Northern Ohio Dental Association............................. 203
San Francisco Dental Association.............................. 203
Southern Dental Association... 364
Texas State Dental Association 253
World's Columbian Dental Congress—Transactions of 151

BIBLIOGRAPHICAL.

Care of the Mouth and Teeth—Popular Essays on, by Victor C. Bell, A.B., D.D.S 155
Catching's Compendium of Practical Dentistry for 1893.............................. 311
Compend of Dental Prosthesis and Metallurgy, by Geo. W. Warren, D.D.S......... 614
Diseases and Injuries of the Teeth, by Morton Smale, M.R.C.S., L.D.S.........52, 101
Etiology of Osseous Deformities of the Head, Face, etc., by Eugene S. Talbot, M.D., D.D.S.......................... 254
Practical Treatise on Mechanical Dentistry, by J. Richardson, M.D., D.D.S........ 51
Sanitarian, The, by Dr. A. N. Bell........................... 208
Traver's Dental Examination Register......................... 208

DENTAL LEGISLATION.

Dental Law of Arizona......... 35
Dental Law of Michigan........ 403
Dental Law of Ohio............. 309
Dental Law of Virginia......... 601

CORRESPONDENCE.

Letter from E. P. Cunningham, D.D.S........................... 204
Letter from Dr. J. W. Kasbeer 463
Mississippi State Board of Dental Examiners, by W. E. Walker, D.D.S........... 253
Regulating Teeth, by J. F. Steele, D.D.S................ 205

IN MEMORIAM.

Dr. Samuel Wardle.............. 103

OBITUARY.

Wm. Henry Eames, D.D.S..... 259
Dr. Corydon L. Ford.............. 255
Dr. A. O. Rawls..................... 257
Dr. Henry Shelley................ 312
Dr. R. B. Winder.................. 416

# THE DENTAL REGISTER.

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# SOCIETY PROCEEDINGS.

## World's Columbian Dental Congress—1893.

### SCIENTIFIC WORK BY SECTIONS.

Reported for the DENTAL REGISTER by Mrs. J. M. Walker.

### FRIDAY, AUGUST 18TH.—FIFTH DAY.—GENERAL SESSION.

(*Continued from page* 612, VOL. XLVII.)

The meeting was called to order by Dr. L. D. Shepard, at 12 M.

Without any preliminary proceedings, the President called for the first paper, entitled: "English Tube Teeth," by John Girdwood, L.D.S., Edinburgh; D.D.S., University of Pennsylvania; Edinburgh, Scotland.

In the absence of the essayist, the paper was read by Dr. A. O. Hunt. The essayist said: The absence of a description of tube teeth in any American work was cause for much surprise to European dentists, as they consider them superior to flat teeth in many cases. He described their several points of advantage, as follows:

1st. That they are much stronger than flat teeth, especially for service as masticators, being supported under the whole lower surface.

2d. In easy removal for repairs.

3d. In requiring no backing, thus eliminating the danger of warping the piece.

4th. In being of the same texture throughout, so that they can be ground down wherever this is required, and polished perfectly.

5th. Their cheapness, owing to their ease of adaptability.

6th. They are a faithful reproduction of the forms of the natural teeth, and, consequently, comfortable to the tongue, and are less bulky.

7th. They are more easily kept clean, because backings are done away with, and better supports substituted, which being surrounded by porcelain are out of the reach of any impurity.

For crown and bridge-work they have all the advantages already enumerated, and, in addition, they can be more perfectly and directly fitted to the root than any other form of porcelain crown. They retain when mounted for wear in the mouth, their translucency and natural appearance, so often destroyed by the gold backing.

The essayist described at length the tools required, and the process of mounting these teeth, as single crowns, with or without caps or bands for bridge-work, fixed or removable, etc. In the use of these teeth the pins are cemented in the teeth with molten sulphur, broken teeth being readily removed by the application of a moderate degree of heat. In conclusion, the essayist asked, "What more can an operator wish, when he has presented to him for use a tooth differing essentially from the natural one in but one respect—that it does not live? What more does the patient demand than that having his dental apparatus restored as far as utility is concerned, he is at liberty to laugh and chat to his heart's content, without betraying the fact that he owes his perfect comfort to art? It is no exaggeration to say that in the use of the tube tooth such a happy state of things is realized."

This paper was referred to Section 7 for discussion.

After the reading of this paper Dr. Shepard called Dr. Lyon to the chair. Dr. Lyon introduced Dr. Marshall, the Treasurer of the Congress, who stated that the number of foreign guests registered is 115; Americans, 982; making a total of 1097. The amount contributed so far is $13,231.95.

The Chairman then introduced Dr. Bryan, of Basle, Switzerland.

Dr. Bryan: I am glad of the opportunity to thank the dentists of Chicago and the administration of this Congress, as well as the committees, and those who have so generously provided for our entertainment here and so hospitably received us. I think all the foreign members will join me in thanking you, and expressing our gratitude for the success of the Congress.

Dr. Thos. Fillebrown, Boston, next read a paper, entitled "Hypnotic Suggestion as a Dental Obtundent and Sedative."

Dr. Fillebrown referred to the contrast between the action of the British Medical Association six years ago, when a paper on this subject was refused a hearing, and a statement in the *British Medical Journal* a year ago, that "Hypnotism has come to stay; it is deserving the attention of every thoughtful scientific man." Last year a paper presented before the American Medical Association on this subject was ruled out, while to-day the subject is chosen by the World's Columbian Dental Congress as the one most likely to interest the largest number of persons, the very large attendance justifying that choice.

The paper was largely a record of cases of the successful application of the principles of hypnotic suggestion, more especially as an obtundent for painfully sensitive dentine, the patient being fully conscious of all that was going on, and fully realizing the obtunding effect of the suggestion; also, in relieving the dread and terror of dental operations, so often a great hindrance to successful operation—its sedative influence on the nervous system, the patient resting during the operation, instead of being exhausted. The essayist recommends the careful study of "Bernheim's Suggestive Therapeutics" to all who are interested in the subject.

The paper was passed without discussion, owing to the lateness of the hour, and referred to Section 1.

After several announcements by the Secretary-General, the Congress adjourned to meet Saturday, at 11 A. M., for the final session.

## WORK OF THE SECTIONS, FRIDAY, AUGUST 18TH.

### SECTION 1.—ANATOMY AND HISTOLOGY.

The meeting was called to order by Dr. C. P. Robinson, of Mobile.

Discussion on Dr. Fillebrown's paper, entitled, "Hypnotic Suggestion as a Dental Obtundent and Sedative."

Several cases were related in which without any thought of hypnotism the results had been similar to those cited by Dr. Fillebrown, who, in substance, replied: I am indebted to the gentlemen for speaking of these cases. When you come to look back over your experience, three-quarters of you will see that you have practically been hypnotizers over a long series of years. You will find that you are in just the condition that a gentleman was who spoke to me a little while ago. He said: "Well, I have been doing just that thing right along, and did not know it." You have ignorantly practiced it, and I come here and declare to you a way by which you can use the method in a great many directions in which you have not used it before. You can all do this when you get home. You can experiment on the first patient you have, whether he knows anything about hypnotism or not. Two friends of mine in Boston have had a great deal of success in this way. Say to your patient: "If you will do as I say, you will find the pain very much relieved. You feel like resting." While you are saying that, if you will watch carefully the muscular tension, you will notice how it relaxes in less time than I have been rehearsing it to you. Then go on and do just as I tell you. Do it quietly, and you may be sure that it will come about and help you wonderfully.

Dr. McKellops: How many men have that power? I have paid a great deal of attention to this. It was illustrated at the Mississippi Valley Dental Association ten years ago. It is all very well for certain people to do that, but I can take any patient, and by kindness and gentleness in my operation, do anything that Dr. Fillebrown does, without any hypnotism. If you treat your patients kindly, and operate gently, you will get the same results as my friend gets from hypnotism. Many men in the profession lack that kindness and gentleness in operations that would make them successful. I used to use ether and chloroform to a great extent. I gave it to man, woman, and child, and I am surprised that I did not kill some of them. I gave it promiscuously, but I have quit doing so. I have done away with those things. I can, by careful operation and handling my patients with care, accomplish anything that can be done with anæsthetics. I want my patients to know what I am doing. I have tried it until I have worn myself out, and I have seen all there is to be seen of this thing in this country. When the profession looks into these things, it will see that kindness will accomplish just as much.

Dr. Fillebrown: Everybody in this world will find some other body that will be influenced hypnotically by him. I know that Dr. McKellops can do anything that I can do. If there is any man on earth who hypnotizes his patients, it is Dr. McKellops. That is one of the surest ways of hypnotizing. Dr. Liebaud was asked once how he cured his little children? He said, " All I do is to take them in my arms, lay my hands on them, and they are cured."

Another excellent point he has made is, that practicing the art of hypnotism helps you. It forces you to kindness. No man can practice hypnotic influence or suggestion, unless he is kind and moderate, and careful with his patients, and that is one of the greatest lessons we learn. Dr. McKellops evidently did not take in the point of my paper. Hypnotism and McKellopsism are synonymous.

Dr. E S. Chisholm, Tuscaloosa, Ala., said he was surprised that the subject should be so seriously discussed by intelligent men. He had not heard a single argument to demonstrate any science in it.

Drs. Poor, Pruyn, Roberts, Burnett, Taylor, Patterson and others, indorsed Dr. Fillebrown's position. Drs. Pruyn and Patterson suggested that such power should be exercised intelligently, and by specialists.

Dr. J. Rabe, Oakland, Cal., asked Dr. Fillebrown to give a practical demonstration. To this Dr. Fillebrown answered he was willing to do so, but that usually in such cases the operator did not like to take a new patient and one whom he had not seen before, but he would take some one as a dummy and show his mode of proceeding. Dr. Fillebrown then took one of the members and showed how he proceeded to practice hypnotism.

The Section then adjourned.

### SECTION 2.—ETIOLOGY, PATHOLOGY AND BACTERIOLOGY.

Section called to order by the Chairman, Dr. G. V. Black.

A paper was read, entitled "Diseases of the Palate, with Reference to Dentistry: Their Pathology." (Illustrated with cases.) By Vida A. Latham, D.D.S., F.R.M.S., Chicago, Ill.

Diseases of the palate are not so rare as is often thought by physicians and dental surgeons, if attention be paid to that part of the mouth.

The anatomical position of the palate, by its structural continuity with the alveoli and gums in front, and its connection posteriorly with the tongue and pharynx by means of the pillars of the fauces, is liable to implication by the extension of disease from these parts; whilst, on the other hand, morbid processes originating in the palate may spread to the neighboring portions of the mouth, fauces, or pharynx.

Inflammation of the buccal tissue is not commonly found extending on to the mucous membrane covering the anterior edge of the coronoid process (the precoronoid space of Allen). Inflammatory action about the inferior third molar is readily transmitted to it, thence involving the soft palate. Conversely, ulcerations of the soft palate may tend to involve the tissues around the inferior third molar.

Other pathological conditions and complications were described; the diseases of the palate being grouped by the essayist as follows:

I. Congenital malformations, as cleft palate, which it is better to treat by itself as a subdivision of palatal disease.

II. Inflammation.

III. Ulcers.

IV. Necrosis, and

V. Tumors.

(Detailed description of numerous cases of palatal diseases which followed will be found in the paper as published in the Congress Transactions.)

In regard to the treatment, the author said: The chief danger in palatal operations is from hemorrhage—the ingress of blood into the trachea, especially when the patient is under ether or chloroform. Cocaine renders this danger much less, but gives another form of trouble by its uncertain action. The difficulties in differential diagnosis are many, and it requires much study to know the nature of the growths and to classify them properly, on account of their irregular morbid histology.

The second paper, entitled, "Some Facts—With Models—Showing the Relationship of the Dental Inter-Articulation with More or Less Obscure Pains about the Mouth and Jaws," by L. Van Orden, M.D., San Francisco, Cal., was read by the Secretary, Dr. Chisholm.

In this paper a number of cases of mal-occlusion, due to various causes, chiefly, injudicious extraction, resulting in various stages of pericementitis, were promptly relieved by the use of the corundum-stones correcting the occlusion, the conclusion being, in the words of the paper: "The main benefit that the writer has derived from the observation of these and other cases has been the conviction that the extraction of one or more teeth, especially of the inferior first molars, is liable, sooner or later, to lead to discomfort in some of the remaining teeth, and that such discomfort may, with patience, be located and relieved by the use of an engine-stone."

There being no discussion of the papers, the Section adjourned, *sine die.*

### SECTION 3.—CHEMISTRY AND METALLURGY.

This Section held no meeting.

### SECTION 4.—THERAPEUTICS AND MATERIA MEDICA.

Dr. N. S. Hoff, Ann Arbor, Vice-Chairman, in the chair.

The first order was the discussion of the paper by Dr. Poinsot, of Paris, France, on "The Extraction of the Pulps from Teeth in a Calcified State, by Trephining," (see page 595, Vol. XLVII.)

Dr. Cravens thought that the paper had suffered in translation, and on his motion, it was passed without discussion.

The next paper, "Experiments with Bichloride of Mercury," by Carrie M. Stewart, D.D.S., Ann Arbor, Mich., was read by the Chairman.

Because of the peculiar action of bichloride of mercury upon material of an albuminous nature, its efficacy as a germicide is believed by some scientists to be less than the standard usually assigned to it. When brought in contact with the substance to be acted upon, the albumen present is superficially coagulated, the interior of the mass escaping many times, because of a lack of penetrating power in the disinfectant. Such being the case, it has been urged that in the action of bichloride of mercury upon the germs of disease, the same effect is produced—*i. e.*—the external gelatinous capsule of the germ is coagulated, while the internal, vital portion is left untouched, and if by any means the compound between this covering and the disinfectant be dissolved, the micro-organism is quite as ready to manifest its characteristic phenomena as though it had never been subjected to the action of the disinfectant.

The paper contained a detailed history of a series of experiments in bouillon culture, using germs of the *staphylococcus pyogenes aureus and albus*, which although not spore-forming in the common acceptance of the term, are nevertheless very resistant to destructive influences.

"This work," the writer said, "was done to satisfy myself of the efficacy of bichloride of mercury as a germicide under certain conditions, and although the experiments made were comparatively few in number, they were accomplished with all possible care and accuracy."

The conclusion reached being that although bichloride of mercury is not sufficiently penetrating in its action to serve as a germicide, excepting under conditions most favorable to its complete performance of the results desired, yet the ideal germicide has not been discovered, and those that are so efficient as bichloride of mercury are hard to find. It would seem from the experiments of others, that the more concentrated solutions of this disinfectant are still less to be relied upon in their action than the strengths more ordinarily used, from the fact that the combination between the bichloride of mercury and the capsule of the germ is more quickly effected, and, although the portion influenced is probably of a firmer consistency than that brought about by using a solution of weaker strength, still the amount of penetration is not so great and the desired results not so nearly accomplished. Because of its extremely poisonous nature, bichloride of mercury will never be extensively used in dentistry, yet, with a proper knowledge of its powers and those of other germicidal agents of a high degree of usefulness, a combination may be effected in the future, which may prove of the utmost value to the oral surgeon.

The paper was, on motion, passed without discussion.

Then followed the reading of a paper, entitled, "Treatment of Abscess of the Maxillary Sinus," by Dr. E. Lecaudey, of Paris, France, which was read by Professor Barrie, of Paris.

He said: During the course of thirty years I have cured among my clients over sixty cases of abscess of the maxillary sinus. Having been a long time studying the subject, I once read a thesis by Dr. Veillard, treating of anal fistula, in which was described treatment with zinc chloride. The idea then struck me to apply the treatment to fistula of the sinus, and I obtained most excellent results.

The cases that I have oftenest treated were caused by the second bicuspid; less frequently, by the cuspid and first molar. The treatment has generally lasted from eight to twenty-one days, and has never lasted more than six weeks.

After having performed the extraction, I wash the cavity of the sinus with hydrogen peroxide; then I inject the following:

| | |
|---|---|
| Chloride of zinc, - - - | 1 gram. |
| Phenic acid, - - - - | 5 " |
| Distilled water, - - | 100 " |

In order to keep the fistula open, I place a little silk string, saturated with wax; and if, as rarely occurs, it will not close up, I take a small pencil of gutta-percha, which I saturate with a little chloride of zinc, place it for twenty-four hours inside of the fistula, and the edges close up by deep cicatrization very rapidly.

I have never had, owing to this method of treatment, any repetition of the disease.

Professor Barrie next read a paper by Mr. Denis, of Paris, France, entitled, "Boracine (Tetraborate of Soda)."

In one of the last numbers of *L'Odontologie* there appeared a most interesting article, treating of the antiseptic properties of boroborax.

For some time past I have used an identical process, and a similar substance called boracine. It is a salt, perfectly purified, resulting from the combination of equal parts of borax and boric acid. This tetraborate of soda is neither caustic, toxic, nor irritating; properties that often belong to antiseptics. Moreover, it has the advantage of being tasteless and odorless, and of dissolving in the proportion of sixteen per cent. I have tested the value of these products, and these are the observations which I have made. First, I have employed it for the disinfection of the dentinal tubuli, and I must say that the results were very satisfactory. I have also applied it in the treatment of the mucous membrane, in which case it has given me astonishing results.

The details of the treatment of several cases were given, the conclusion reached being: "I think, therefore, it would be a good thing to generalize the employment, particularly for the buccal mucous membrane, which interests us the most. In order to sustain such results, I could not do better than quote the names of Drs. Galezowski, Landolt, Hubert, LaGrange, etc., all of whom now employ boracine in all their clinics with great satisfaction."

There being a very small attendance at this Section, on motion the discussion of the papers was passed, and the Section then adjourned *sine die.*

## SECTION 5.—DENTAL AND ORAL SURGERY.

The Secretary-General, Dr. A. W. Harlan, was introduced to this Section by the Chairman, Dr. Brophy.

Dr. Harlan said, Mr. Chairman and Gentlemen: It has been impossible, on account of the numerous duties I have had to perform, to visit personally the various Sections, but to-day it has come my way to visit this Section, and from the reports that have been published from day to day we learn that some of the most valuable papers of the whole Congress have been presented here. And the object of my visit at this time is in the interests of surgery. Dr. Harlan then announced that Dr. Younger would give a clinic upon implanting one or more teeth, at the clinic rooms.

The Section then proceeded to the discussion of the topic: "What Neoplasms, both as to Kind and Degree, Necessitate the Excision of the Inferior Maxilla in whole or part when Associated with that Bone?"

Dr. Cryer, Philadelphia, Pa., opened the discussion by saying: I will classify diseases of the jaw into two kinds. Those of the inferior maxilla are either explainable or unexplainable. We know if we have the ordinary fistula situated below any of the teeth, we have to call it a dental alveolar fistula. If we have a tooth that is devitalized and an abscess below it, that is what I would class as an explainable disease. Then we can have growths coming up between the teeth which on the first appearance would appear to be non-explainable, but if by passing along the side we find this to be a fungoid growth that comes out of the tooth, it is certainly explainable. Another fungoid growth comes between the teeth where the teeth are healthy and are normal, and you can rest assured that this is not explainable. Of course, the unexplainable disease cannot always be cured, but if you know the cause it can be treated and cured. If you have one of those growths that is not explainable, do one of two things—cut it out, or let it alone. Don't use caustics. If you do it will break down the tissue and make it worse than before. Now, how far shall we remove the bone that is the seat of neoplasm? In any case remove the neoplasm. If it includes a small portion of the bone, remove it; if a large portion, remove a large portion; if it includes the whole jaw, remove it. I have a specimen with me which was pronounced a neoplasm. It was immediately behind a bicuspid. It puffed up and filled a greater portion of the mouth on one side until the patient could not close the mouth. The operation of a great majority of surgeons would have been, and it was recommended in this case, to remove half of the jaw.

Fortunately he fell into the hands of a man who came from the dental profession originally. He said: "No, remove that tumor and nothing more. Take off the main portion so you can see what you are doing, and then get down as far as it exists." The surgeon in this case cut away the large mass in the mouth and opened the lip at the median line and exposed the bone; he had his instruments ready to remove all if necessary, but he said: "We will go down first and cut out what we can with a circular saw, and then we will take the burs and smooth the part up, leave all the good tissue that is there and remove the bad." That section which I show you was removed, and we found we had not got all the diseased part out; burs were then used, and all the diseased bone, and a little more, was taken away, leaving a narrow rim of healthy bone with its overhanging edges of periosteum. When the bone is healthy, by all means leave it there, as was done in this case. This operation was performed eight years ago, and the patient has been acting on the stage all over the United States since that time.

Therefore, I wish to say again, cut away a neoplasm, and I might say a little beyond it, but no farther. Don't take out half a man's jaw if you can save even only a little rim of it. All who have seen this kind of operation, know that the bone to a very large extent will be reproduced, and then an artificial appliance can be placed in the mouth, and the man will be almost in a normal condition.

Dr. Younger, California, said: I have had to treat a number of cases, and found by the use of lactic acid I could remove the diseased bone without the use of the knife. I had a case where all the surgeons were against me. They were going to remove the jaw for a cancerous structure. The doctors said the only way was to remove the bone. When the lady came to me I found the pus discharging from different places, and I had been experimenting with lactic acid in similar cases, and so I suggested its use. I used lactic acid with about equal parts of warm water, as I find that is more effective than cold water. Afterwards I used a stronger solution. The operation was successful.

Dr. Brophy: Upon the closing of our Section, and the closing of the work which has been put before us to do, I feel that we have occasion to congratulate ourselves. A month or two ago it looked as though this Section would not be able to accomplish much. This afternoon I feel that when the records are prepared and published, the work of this Section will compare quite favorably with that performed in any other Section of the Congress. I feel that the work done here will reflect credit upon those who brought about this great meeting, and that our transactions when put in book form will fill an important place in the history of dentistry.

On motion of the Secretary, the Section adjourned *sine die.*

### SECTION 6.—OPERATIVE DENTISTRY.

The meeting was called to order by the Chairman, Dr. Jarvie.

A paper was read by Dr. Geo. W. Whitefield, of Evanston, Ill., entitled, "Conservative Method of Treating Fractures of the Anterior Teeth."

He said: As long as children play and stone sidewalks are hard, so long will teeth occasionally be broken off. Sometimes a whole tooth is knocked out or broken off at the gum line, but more often simply a corner is chipped. Again, the whole incising edge is snapped off far enough down to involve the pulp. What should be done in such cases? These accidents most often occur in childhood, so that we, as conscientious practitioners, must consider what is best, not only to remedy the present disfigurement, but also to secure the best results for a lifetime. For these young patients the extirpation of the pulp and placing a crown should should be the last resort.

Several cases in practice were then related. The Conservative Treatment of a Pulp exposed through the Fracture of a Central Incisor is thus given:

With bibulous paper I removed the blood from the exposed portion of the pulp, bathing it with a mild antiseptic, and after thoroughly drying the fractured end of the tooth, including the exposed portion of the pulp, I flowed collodion over the pulp, allowing it to extend a short distance beyond the exposure. After this was dry I repeated the operation two or three times, then before the last coat was quite dry, I covered the spot with a small piece of No. 4 gold foil. I repeated this operation with the collodion and gold foil several times; then being careful to remove all collodion from the margins, I flowed Justi's cement mixed to a cream over the end of the tooth, partially restoring its contour. Little more than two months later, finding the pulp alive and not very sensitive, I fitted an open-faced gold crown to the tooth.

In another case where a central incisor was so broken that when ground to a straight edge it was left one-eighth of an inch shorter than the other central, he proceeded as follows: I fitted a gold cap to the gingival margin, soldering a hook on the labial surface close up to the gum line.

At another operation I adjusted bands around the lateral and remaining central near the excising edge, each having a loop of hollow wire soldered on the labial surface. Taking a piece of fine piano wire I filed it down so that it would bend as a bow. Resting it in the loops in the bands on either side of the broken tooth, I sprung the piece of steel into the hook on the gold crown—a very weak spring was all that was needed to bring the tooth to the line with its mate. The moving of the tooth was accomplished in less than a week, with no disturbance to the pulp. This method is applicable to partially-erupted teeth; only in such cases it will be harder to adjust the crown.

Dr. Jarvie: At the meeting on Wednesday, there was a paper read on Oxyphosphates, and it was plain that to retard the setting of the oxyphosphate it was wise to use a bottle filled with ice-water. That was questioned by others in the room, among them by Dr. Knapp, of New Orleans, and he is prepared now to demonstrate the fact that it is impossible to properly mix the oxyphosphate on the outside of a bottle filled with ice-water.

Dr. Knapp said, that the moisture which condenses upon the outside of the bottle precludes the possibility of mixing cement on its surface. He said: The point I wish to make is, that no solution has yet been given by any of the members. It would be highly edifying to all of us to know how the crystallization of cement can be produced more slowly for setting bridge-pieces, particularly where there are three or four caps to be filled with the cement.

Dr. D. M. Cattell, of Chicago, Ill., read the following paper on "Operative Technics:"

The name "Operative Technics" is understood as the title of a department recently added to the curriculum of a few dental schools.

Since students generally began matriculating in dental schools, it has been noticed that students in the clinical department were not so well trained in the use of instruments at the beginning of their career at the chair as was desired, nor were those so apt who came first to college as those who had taken advantage of preliminary work under a preceptor.

So marked was this lack of manual dexterity, that when Dr. G. V. Black took charge of the infirmary of the Chicago College of Dental Surgery he immediately set about devising means for overcoming this deficiency, resulting in a paper before the Odontological Society of Chicago, June 21, 1888, entitled "Outlines of a Course of Study in Operative Dental Technics," and at the opening of the next school term in the institution with which Dr. Black was connected, the World's Pioneer Class in Operative Technics was organized.

Considering the newness of the course established, the inexperience of the instructor in that kind of work, the lack of practical experience as a guide to better effort, with no text-book applicable to any one of the many lessons gone over, the result was, in the highest degree, satisfactory.

The second year's work, with the experience acquired, was much easier, although many low places in the path had to be built up.

The third year was one of decided progress, owing to the fact that Prof. G. V. Black had issued his "Anatomy of the Human Teeth," which was just such a work as we had needed.

Five years have passed since the inauguration of the first class in dental operative technics. In that time much improvement has been made in the methods of teaching and systematizing the work.

In its beginning the course occupied three months' time; it is now lengthened to six months.

The technic department has for its aim four cardinal points:

1st. Manual training, or handicraft.

2d. System.—Each step following the other in methodical order.

3d. A greater familiarity with teeth.—Outward forms, inner channels, structure and plan of development.

4th. Individual reasoning.—Teaching students how to think for themselves.

The work of the department is divided into studies or lessons. Each division has its own heading, and notes of all work done under that heading must have its particular allotment of space in the note-book of each student. One study may be extended over a period of from three days to as many weeks, owing to the breadth and importance of the subject, or certain lessons may be continued and taken up again as opportunity presents. The present course, as given in the Northwestern University Dental School, is divided as follows:

1st. A study of technical terms, a hundred or more words with which the student will come in contact all through the lecture course and text-book reading. These words, when thoroughly understood, become the key by which students can often unlock and open to themselves the meaning of many otherwise obscure sentences. Examples: Abscess, ulcer, pulpitis, pericementitis, disinfectant, antiseptic, incise or incisor (scissors), septic, aseptic, caries, necrosis, mortification, gangrene, stimulant, anodyne, anesthetic, deciduous, mesial, distal, buccal, occlusal, etc.

2d. A study of typical tooth-forms, including their several surfaces and surface markings; noting certain "landmarks" peculiar to each denomination of teeth; also malformations. In this lesson each student has the work of Prof. Black, on the teeth, as a text-book. He is also supplied with a "ring of teeth"—a set of typical teeth properly arranged and strung on wire bent in the form of a ring for convenience in handling. When the study of a certain tooth is taken up the student has this tooth before him on the ring. There are also charts hung up in the class-room. These charts represent the same pictures enlarged as seen in the text-book, showing the several surfaces of each respective tooth. If possible, the student should have several teeth before him of the same denomination under discussion, that he may become familiar with the common variety of forms. After going carefully over the several surfaces and noting their lobes, developmental lines, sulci, and other face-markings, each student is then invited to select a tooth similar to the one undergoing inspection, from a miscellaneous lot of extracted teeth.

3d. A study of pulp chambers and canals. The student, having been supplied with a box containing some twenty or more wooden blocks one and one-fourth inches long by three-fourths inch thick, now fastens the tooth he has just selected, lengthwise on the block with sealing wax. The tooth and block can now be set in a small bench-vise. Two or more teeth of the same denomination are to be selected, and so arranged upon the blocks that different faces of the tooth will be presented to view. With selected files the student cuts away the tooth fastened on the block, so as to expose the pulp chamber and canal throughout its entire length; the cutting continuing until the central portion of the chamber is reached; he then removes the block and tooth from the vise. Now using the block as a handle he "inks" the exposed cut surface of the tooth, and presses it down upon a slip of selected paper, and the result is the so-called "silhouette pictures," showing the pulp chambers and canals. Of each tooth so dissected the student makes a line containing not less than five pictures. And of each denomination of teeth there should be several aspects of the chamber opened. When all the cuttings are made, the blocks to which they are attached are arranged in proper order in the original box, and kept by the student as a memorial of his early professional studies. The silhouette pictures of each denomination are printed on separate pages, of a specially-ruled blank book, and constitute when done a text-book, if you please, on the subject, that the student may keep for ready reference.

4th. The physical, anatomical, chemical and microscopical divisions of tooth structure. These studies are prepared by the means of lectures and charts, and when possible, having students make both longitudinal and cross sections, studying them through the microscope. This work for the freshmen should be rudimentary, as a more careful study of both hard and soft tissues will be had in the regular histological course. A special study of enamel in reference to cavity margins is made. The idea is to impress upon the student's mind the need of greater care in preparing enamel margins of cavities preparatory to filling.

5th. Free-hand drawing and modeling. The drawing of the different surfaces of the teeth by students helps to train the hand, as well as to call closer attention to form and certain surface markings. While the time is not sufficient for a thorough course in drawing, yet much may be done in the way of starting the student toward a better method of explaining or demonstrating a point in future before dental societies. Modeling teeth in clay, or its equivalent, is excellent training for both hand and eye, and should be indulged in as much as time will permit. The models should average at least six inches in length.

6th. A study of the more common medicaments such as are found generally in dental offices. This is not intended to supplant the systematic work of the chair of materia medica and therapeutics, but is preliminary to it, not going into detail other than to give the origin of the drug and the name of the dentist who proposed the remedy, if known, and his method of using it; also from whence the medicine is derived. Many of these remedies are compounds or mixtures. These remedies should be classified as disinfectants, antiseptics, anodynes or obtunders, stimulants, counter-irritants, etc. Each student should have in his case some eight or ten bottles, and these should be supplied with certain medicines for his experiments while in the class. These drugs are to be handled, looked at, smelled, tasted, indeed gotten thoroughly acquainted with.

7th. Students select from a miscellaneous lot of teeth placed before them a set, many of which should contain cavities ranging from simple exposure of dentine to large cavities involving pulp chambers. These teeth should be properly arranged as to original position, and their roots imbedded in gutta-percha. This set of teeth, so arranged, is to be considered a *dummy patient* for the student to practice upon. A wooden block carved to the shape of a human head, with a movable lower jaw, and instead of ridges to represent the alveolar processes there should be wide and deep grooves into which the gutta-percha that is to surround the roots of the teeth is placed. (Magnusson's Dummy Head is excellent.)

8th. Pulp-capping and devitalization. With the "dummy" before him, representing a supposed patient, the student seeks for slight pulp exposures; having listened to a lecture on the subject regarding the diagnosis, prognosis, treatment, and final capping or devitalization. As each pathological case is presented the student applies the remedies supplied in his case-bottles as directed by the instructor; after due treatment the supposed exposed pulp is capped or devitalized according to the specific directions of the instructor in charge.

9th. Supposed cases of dying pulps, putrefying pulps and entirely decomposed pulps. From the medicines furnished him each student applies treatments to the different conditions suggested, until he becomes familiar with the class of remedies required in each pathological condition.

10th. A study of the pathology and therapeutics of alveolar abscesses—blind or sleeping, acute, chronic, fistulous. Also of ulcers, pulpitis, pericimentitis, etc. This is done by lectures and charts; students making applications to supposed lesions from their medicaments.

11th. Cleansing, drying and filling root canals is practiced until students become quite familiar with the different methods of procedure; giving preference always to the one considered the best.

12th. Bleaching teeth. This study is made by the way of lectures and experiments in test-tubes or beakers upon vegetable matter, so that the results are soon observed by the students. Also practical application to discolored teeth found in the miscellaneous lot.

13th. Instruments. Each student supplies himself with a set of instruments and certain appliances according to a list furnished him. No other patterns are allowed. These instruments are a part of the set required of junior and senior students on entering the infirmary the following year. These instruments are classified and named. This classification and naming are according to certain rules recently proposed for the use of the school by Prof. G. V. Black. Students are furnished brass wire of a certain size, from which they are to make models of those called for by the list.

14th. Preparing cavities. Students are instructed regarding the opening up of cavities, and the proper shape they should assume. The simpler forms only are studied here—beveling of enamel-margins; what instruments should be used and how to grasp them. (No engine is allowed in this course.) *Hand-training* is one of the cardinal points. Ivory, bone, or certain compounds are often substituted for teeth in which to form cavities – typical shapes.

15th. Filling materials. Students practice filling these cavities with the different classes of filling materials—gutta-percha and the different preparations of the same; cements—both phosphates and chlorides; amalgams—alloys and copper, tin, aluminum, gold, both non-cohesive and cohesive, and combinations of two or more. These filling-materials are *studied.* Many of the cements and amalgams are made before the class.

16th. Miscellaneous matters. Any matter that may seem important that the freshman class should be posted in. These matters can be sandwiched in any time along through the course that the instructor deems best.

This course of technics may be somewhat modified each year, always with a view of bettering it. One essential condition of the course is, that nothing must be taught here that is not in accordance with the teachings of other special chairs; nothing taught that must be untaught by succeeding instructors; hence, the technic teacher should be familiar with the methods advocated by the other professors of the institution with which he is connected.

Now, if by means of this course of instruction students can be benefitted manually and mentally in a manner which is unattained by other known methods or systems of teaching, this effort will not have been in vain.

If the student has gained in handicraft, systematized his daily course of procedure, become more intimately acquainted with the organs on which his future labors will be bestowed, has learned the art of thinking for himself, and become logical in his reasoning, he is then ready to pass into the clinical department and there add practical knowledge to the hints he has thus far received.

## DISCUSSION.

Dr. Carlton: I wish to make this suggestion in regard to cutting the sections: I precede the cutting by some instruction in instrument-making. I have the students make some delicate canal-instruments, such as canal-broaches, of piano wire. They are easily made, and if they spoil one they can easily make another. To any one who has ever cut sections, he will know it is quite easy to enter the pulp-chamber first; after having entered the pulp-chamber the broach can be inserted into the canal or canals, as the case may be, and this gives the student some training in the feeling of a broach in the canal. It gives them manual training, technical training in broaching canals; and the broach may be left in the canal and we may file until it is reached, which obviates the occurrence of that which I have found to be frequent with the novice—the destruction of the canal before they knew they had reached it. They strike the steel and they know they have reached the canal, and that warns them to be careful.

There is another point I think has not been sufficiently emphasized in the paper. That is instrument-making and sharpening. Those of us who have practiced in cities, and can get to the dental depot and get the most approved instrument at a moment's notice, do not appreciate how important it is to have such knowledge.

I think also the student should understand the quality of the material, so I have incorporated in my technics some lectures and instructions by demonstration of steel, what steel is, and the percentage of carbon that the instrument of steel should contain, the colors that indicate different degrees of hard temper, how to temper an instrument, and how to use a file in shaping an instrument. Then I give some little explanation by diagram of the different angles for the instruments in the cutting of different kinds of enamel or dentine, and for scraping.

Dr. H. A. Smith, Cincinnati: I want to bear testimony to the statement made in the paper, that the teaching of technics in the manner described is a real advance in the method of teaching, and I know the student that has taken this training comes to the chair of the patient a much more intelligent operator than without it. In the single matter of root-filling, about which we hear so much, the student who has mastered the cutting of teeth as laid down and taught now in colleges, will not meet the exaggerated difficulties which we hear.

Dr. G. V. Black said: This system is very young yet, and its full good has certainly not yet been demonstrated. The other department of prosthetic technics is going along with it, not in this discussion perhaps, but is following the same path and is doing the same good; good not only to the student of the school, but a great good to his patients who come to the school to be treated. For the sake of humanity, these boys require this training before they go to a patient.

Dr. Cattell, in closing the discussion, said: I have received many suggestions from Dr. Weeks, and many others who are interested in this work, and I want to take this occasion to thank all of those who have made such suggestions.

The Chairman: The Section of Operative Dentistry will now adjourn *sine die.*

(At the close of the meeting the representatives of eight schools interested in teaching dental technics met and organized the Association of Teachers of Operative and Prosthenic Technics. After electing Dr. D. M. Cattell, President; Dr. J. A. Dale, Secretary, and appointing a Committee on By-Laws, the meeting adjourned to meet at the call of the President.)

## SECTION 7.—PROSTHESIS AND ORTHODONTIA.

The Section was called to order at 3 P. M., Dr. C. L. Goddard in the chair.

Dr. Geo. V. I. Brown, Duluth, Minn., read a paper entitled, "Prudence and Gutta-Percha, in Crown and Bridge-Work."

He said: My desire is to avoid, as far as possible, the detail of mechanical construction, and deal with the broad, underlying principles that govern the attachment of a foreign substance to a root in the living mouth, as a substitute for nature's perfect crown-work, and the yoking of one tooth to another to support substitutes, and calling upon them to perform duties belonging to the full number.

Experience has certainly given this class of work an unquestioned right to be considered among the useful and therefore reputable operations in the oral cavity; and the query naturally arises, "What has been the effect of this introduction upon the general practice of dentistry?" And a glance at the record seems to prove that the result has been a marked one both for good and for ill.

The benefits have been the preservation and restoration to a state of usefulness of many roots and broken down crowns of teeth that would otherwise have been lost, thus putting off the evil day when artificial dentures would be necessary.

Again, the result of this effort to utilize such roots has more than anything else influenced the wonderful advance in the therapeutic methods by which they are restored to healthful usefulness, and diseased conditions removed.

An advance has been made, in that while the average dentist was almost totally ignorant of the metal plate-work, to-day every student is required to have sufficient skill in this direction to be able at least to make an artistic-looking gold crown. On the other hand, instead of acquiring greater perfection in filling, the temptation has led to the wholesale destruction of natural crowns that might properly have been filled.

The principal points in crown-work are:

First: Attachment to secure without fear of dislodgment.

Second: A natural appearance if for the anterior teeth.

Third: Provision against the action of destructive agents at or near the gingival line.

Fourth: Secured against danger of splitting by a band, or its equivalent, by forming the joining surfaces of root and crown in such a manner as to equalize the strain.

Fifth: The imitation of the natural form of the crown upon proximal and occluding surfaces.

He said: I begin with the broad-sounding but quite true statement, that crowns inserted with any of the oxychloride or oxyphosphate cements, without band or other protection at the joining with the root, no matter how secure the pin may be, must be considered as of a temporary nature, for no matter how perfectly the surfaces may be adjusted, disintegration will surely follow, and not only cause loosening of the crown but allow more or less destructive action upon the root itself.

The use of amalgam as a setting is, of course, a great improvement upon cement in crowns of this class, but even amalgam is not always proof against bacterial influence at that critical point, the gingival line, as is shown by the frequent failure of fillings.

The teachings of Dr. Flagg and his followers, while perhaps going further than could be generally recommended, have at least been instrumental in establishing the value of gutta-percha in its capability to withstand the action of the acids of the mouth, and as a preservative against caries even where every other filling material would fail; its only disadvantage being that it wears away too readily in exposed positions; but while its good properties are of the first importance in crown-work, the softness does no harm, because it is protected from wear and will not disintegrate. The advantages may be summed up before proceeding to more detailed description under the following heads:

First. It is impervious to acid secretions or bacterial influences.

Second. Not irritating to surrounding tissues.

Third. Easily removed when necessary.

As against these three there is simply one consideration, viz: the difficulty of adjustment.

To one accustomed to use cement for this purpose, the difficulty of applying gutta-percha as a substitute seems almost insurmountable; but a moment's recollection of the trials attendant upon the setting of his first crowns will recall the fact that cement too had its difficulties for the beginner.

For gold crowns, where teeth are covered entirely, I prefer the red gutta-percha we get in the form of sheets. It has a degree of toughness that is valuable, but for anterior crowns with open faces the red line at the edge of the openings is undesirable, and I therefore use some white preparation that softens at a low temperature, as this property greatly facilitates its handling in the mouth. There being no danger to apprehend from wear, hardness is not so desirable as for filling.

It is my custom to heat both crowns and setting-material upon a tray to protect from the open flame, spread with warm instruments a thin coating over the inner surface of the crown, which should be first roughened on the inside by scratching with an instrument, aiming to have as nearly the exact amount necessary as possible, but depending upon a vent to get rid of a small amount of surplus; then after drying the surface of the teeth with alcohol and warm-air blast, wipe with some suitable germicide, saturate a pledget of cotton in eucalyptus, coat the surface with it to prevent the too rapid drying of the chloro-percha, of which a thick solution is then applied around the neck, so that when the crowns already heated as hot as they can be handled in the fingers, and prepared as described, are driven home, the eucalyptus, chloro-percha, and gutta-percha in the crowns will form a thick creamy mass that will penetrate and perfectly fill every space about the necks, and even if surplus be not removed afterward, will not cause irritation as might a particle of cement in the same position.

Sometimes too much gutta-percha will prevent the crown going quite into the proper position, just as sometimes happens with cement; but the remedy is much simpler, because easily removed while still warm; or if, for accidental or other causes, removal be desired afterward, hot water or hot air applied will in a short time heat the metal sufficiently to soften the material and facilitate the separation without the necessity of damaging the crown, and any one who has tried to pull them off without first warming them will be quite satisfied that any properly adjusted crown can be securely held in this manner.

After some discussion on this subject by Drs. Dunn, Matteson, E. P. Brown, C. L. Goddard, Oliver, Burne, of New South Wales, and W. P. Smith, Dr. Geo. J. Dennis, of Chicago, Ill., read a paper, entitled, "A Study of the Masticating Force of the Jaws."

He said: When he began his investigations of this subject he had hoped that some scientific knowledge might be gained of the stableness or unstableness of bridge-work, judged entirely from the mechanical standpoint. The subject was thoroughly investigated. Competent civil and mechanical engineers were consulted, but all acknowledged that the solution of the problem was entirely beyond them for these reasons:

1. Absolutely nothing was known concerning the resistance to strain, either direct or torsional, of the material (gold) used in forming the superstructure of the bridges. Its elastic qualities were also unknown quantities.

2. The supporting beam in dental bridges constantly varies in size and shape, so that no calculation could be made as with a square or triangular or even a rectangular beam of even size and shape throughout.

3. The varying density of the material of this superstructure, composed as it usually is of two, three, and four grades of gold, presented a combination upon which no calculations could be based.

4. The method of attachment of the superstructure to its abutments was an unknown factor and incapable of solution, for its strength must vary extensively with the peculiar conditions present in each individual case.

5. The strength of the superstructure was one of such great variability that nothing could be determined in regard to it.

After much investigation and research, he had constructed an instrument designed to contribute to a solution of the problem, by giving accurate information upon the amount of force exerted by the maxillary muscle in the closure of the jaws.

This instrument has a register of ninety-five pounds, and tests were conducted to determine the actual masticatory force of the maxillary muscles. So far but one person has been found who could accomplish the full register. From forty to sixty mouths have been examined. The range of the indicator, when placed between the molars of the adult jaws, was from sixty-five to eighty-five pounds, occasionally, but rarely, passing from eighty-five to ninety-five pounds. Between the bicuspids the force is found to diminish from five to fifteen pounds, the range extending from fifty to sixty-five pounds. Between the incisors the range extends from thirty to fifty-five pounds, showing a further diminution of about twenty pounds, as the pressure was applied at a greater distance from the location of the power.

Among children whose ages range from eight to fourteen years, a peculiar fact was noted in that the greater force was applied through the incisors rather than through the molars. The force exerted in these cases ranged from twelve to twenty-five pounds upon the anterior teeth, while upon the posterior the range was from ten to twenty pounds. The cause of this state of affairs is that during these years the permanent incisors have become firmly fixed in the jaws, while the temporary molars are being absorbed, their roots lacking the usual strength, which by reflection caused a less force to be exerted by the muscles of the jaw.

In the mouths of persons wearing plates, the amount of force was still less, ranging only from five to twenty pounds.

These figures apply to the greatest force that the jaws of persons of average strength exert. It is the belief of the writer, based upon experiments in his own mouth, that the actual pressure exerted by the jaws in the ordinary movements of chewing the food is only about one-half that of the figures given above, while in most cases in which the food is not properly masticated the force exerted will be found to be only one-third or even one-fourth that of the figures.

Thus it will be noted that our preconceived ideas in regard to the masticating force of the jaws have been greatly at variance with the actual facts. It is the hope of the essayist that the facts here set forth may be of service in the future in the study of strains placed upon fillings, crowns, and bridges, and all artificial dentures of whatsoever kind. As his observations become more extensive, further statistical information will be furnished through the medium of the dental journals.

There was no discussion, and the Section adjourned, *sine die.*

SECTION 8.—EDUCATION, LEGISLATION AND LITERATURE.

Dr. Patrick, the Chairman, called the meeting to order, and as there was not a quorum present, the motion was made and carried, to adjourn.

[*To be continued.*]

## The Woman's Dental Association of the United States.

The meeting of the Woman's Dental Association of the United States was held in the Memorial Art Palace, Friday, August 18, 1893, commencing at 10:30 A. M. Between thirty-five and forty women dentists were present.

In the absence of the President, Dr. Mary H. Stillwell, the meeting was called to order by Dr. Emma L. Benham, and on motion, Dr. Elizabeth Davis, Philadelphia, Chairman of the Executive Committee, was called upon to preside.

The Secretary, Dr. Eliza Yerkes, read a letter from the President, expressing her regret at her unavoidable absence. The President spoke of the apathy of women practitioners toward any concerted efforts for their own advancement, but the work of forming an association of women dentists had been accomplished, and the movement would doubtless prove of the greatest advantage to all women practitioners.

The Corresponding Secretary, Dr. Anna T. Focht, Philadelphia, in her annual report, laid great stress on the fact that great indifference had been exhibited in the matter of replies to letters and circulars sent out from her office.

A brief review of the history of the National Association was given by the Recording Secretary. The first meeting looking toward such an organization was held March 19, 1892, and a charter was obtained in July, 1892. At the present date there is a membership of thirty-three registered women dentists, with six applications under consideration.

The Treasurer's report for the year showed a small balance on hand.

The roll of States represented in the association was then called for, with reports from the several Vice-Presidents.

The Vice-President from the State of Illinois reported that there are in the State five colleges recognized by the National Association of Dental Examiners as *reputable*. Unfortunately, two of these refuse to admit women as students. There are eight registered women practitioners in Chicago, one in Springfield, and probably others in the State. Woman's work in dentistry is recognized as creditable and satisfactory.

The officials of the World's Columbian Dental Congress have shown the most favorable disposition toward women dentists, but the women themselves have been slow to respond. Women physicians and women dentists work harmoniously together, especially since the more general recognition of the reflex of the fifth nerve. Dentistry is recognized as a specialty of medicine, and women dentists must make every effort to rise proportionately. I hope, then, that our women will come forward and take hold of society work, the surest method of self-elevation.

The Vice-President from Massachusetts said she only knew of five women practitioners in her State. The Boston Dental College admits women students on an equality with men. Harvard does not yet admit us, but one of their professors said to me, "You are knocking at the door so loudly that we have got to do it."

The representative from Maryland said that she occupied the forlorn position of being the only woman practitioner in that State. Women were not admitted to the colleges nor to the societies, except on one occasion she had been offered a position on a committee requiring the payment of a fee.

The Vice-President from Washington, D. C., sent the sad message that she was writing from the bedside of a dying father, and could furnish no report.

The representative from Rhode Island said that she also claimed fellowship with Massachusetts, as she was a graduate of the Boston Dental College. She was a member of the State Society, and had never met with any professional opposition in either State.

The representative from Wisconsin stated that six or seven ladies were practicing dentistry in that State, and they seemed to be gladly welcomed by the people.

The Corresponding Secretary now read a most interesting letter from Prof. Jas. Truman, relating the struggles marking the admission of women into the dental colleges. At the conclusion of the reading, on motion of Dr. Hirschfeld, the first woman graduate in dentistry, a rising vote of thanks was tendered Dr. Truman, in recognition of his services in the cause of woman in dentistry.

Dr. Truman responded with great feeling to this mark of appreciation.

The Chairman of the Association hoped that some action would be taken to give the letter of Dr. Truman greater publicity than would be secured by its publication in the annual transactions of the Association, which would reach only the members of the society, and a committee was therefore appointed to see that proper publicity be secured.

Dr. Benham thought that as a history of women in dentistry it should have a place in the transactions of the Congress, beside that of Dr. Shepard giving the history of what man has done in dentistry. The photographs of Dr. Truman and Dr. Taft were also desired for a place in the transactions of the Society. It was stated that the Baltimore College of Dental Surgery had graduated eight or ten women while Prof. Gorgas was Dean of that institution.

The question was asked as to the number of women graduates in dentistry. The reply was made that the present location of about one hundred and fifty was known, though there were more than that number, as many had made no response to letters, which, however, had not been returned to the writer. The colleges know how many they have graduated, but they cannot keep track of their locations.

Certificates were read showing that Mrs. E. R. Jones had, prior to 1859, assisted her husband in his dental practice, and had continued it after his death.

The recognition of the society was given to the labors of Dr. Hattie E. Lawrence in forwarding the interests of the present meeting.

The representatives from Colorado, Missouri, Montana, and Nebraska presented their respective individual reports, and Mrs. J. M. Walker spoke for the women of the far South.

A message of greeting to the absent President was voted, and the Association then adjourned.

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# COMMUNICATIONS.

## The Early Women in Dentistry.

BY LUCY HOBBS TAYLOR, D.D.S.

Contributed at the request of Mary Gage Day, M.D., Chairman of Kansas Branch of Medical Department of Queen Isabella Association.

Somewhere back in the early part of the 50's, to be accurate, in the fall of 1859, there appeared in the western horizon a cloud "not as big as a man's hand," for it was the hand of a young girl risen in appeal to man, not for charity, but for the opportunity to enter a profession where she could earn her bread not alone by the sweat of her brow, but by the use of her brain also.

The cloud though small was portentous. It struck terror into the hearts of the community, especially the male part of it. All innovations cause commotion. This was no exception. People were amazed when they learned that a young girl had so far forgotten her womanhood as to want to study dentistry. After a lapse of almost thirty-five years it is impossible to give a just conception of the bitter opposition and the foolish objections that Lucy Hobbs had to meet and overcome.

The main objection was that her place was at home, taking care of the house. They forgot, nay worse, some of them did not care, that she had no home—and that was the main reason she wanted to learn dentistry. The search for a place to study began. She went from office to office. Some were afraid their characters would be ruined if it were known that they had a lady student, forgetting that nine-tenths of their patrons were women. One was kind enough to propose to let her come and clean his office and look on while he worked, if she would not let any one know that she was learning. This she indignantly refused. She was willing and anxious to work, but she was a self-respecting woman. Nothing daunted, she kept on until nearly every office in the city of Cincinnati, Ohio, was besieged. At last she was successful. Dr. Samuel Wardle, a large-hearted, Christian gentleman, gave her a place in his office, on the same footing as other students. To him alone belongs the honor of making it possible for women to enter the profession. He was to us what Queen Isabella was to Columbus; may his name, like hers, be revered by every woman in the profession.

No pen can portray the toil and privation of the next few months. In a little attic room the nights were spent with the needle, earning a few pennies for the morning meal; the days, incessantly toiling at a new and strange task. A previous study of medicine made the study easy, but there was much other hard work connected with an office experience. It required all her Yankee perseverance and pluck to hold on. Days, weeks and months rolled on. She was prepared for college. In March 1861, she made application to the Ohio Dental College for admission. Such boldness in a woman shocked the professors of so respectable an institution. Of course they refused.

Dr. Wardle advised her to commence practice without a diploma, as a large majority of the male practitioners of that time were not graduates. She was thwarted but not defeated, for she then fully determined never to rest until dental colleges were open to women.

She opened an office in a room in a little plain building on Fourth Street, Cincinnati, Ohio. She was of good courage even though the pittance left after rent was paid was very meagre—only twenty-five cents per week, at times, kept her from starvation.

The war commenced that April. Business was paralyzed. A penniless girl could not live where old practitioners failed. So she went to Northern Iowa. A friend helped her with money to pay her fare. She opened an office. Many called from curiosity. Little by little her practice increased. The first year she made her expenses and the one hundred dollars which paid for her dental chair. The beginning of the second year found her equipped for business.

There are passages in all lives where it would be well if all books were closed. Words never explain the heart-aches. Such a one is the lone fight of a young girl, against the whole world. Justice comes so slowly.

With the same steadfast purpose she pushed on. The second year brought reward, as the world reckons it. There was a three thousand dollar balance on the other side of the ledger. From that time on the sky was brighter. The silver lining began to show, and a confidence born of success took the place of sadness. Her reputation widened until all Iowa knew of *the woman that pulled teeth.*

The Iowa Dental Association was composed of grand, just men. Through their President, Dr. L. C. Ingersoll, they sent her an invitation to attend their convention. It was with many misgivings that the best frock was donned, the office closed and the invitation accepted ; but one grasp of the hand of the president dispelled all alarm. Professional recognition after six years struggle was a balm for many old wounds. The by-laws were changed to meet the case, and the woman dentist was made a member of the association. Then the battle commenced in earnest—the woman dentist with her well-filled purse and the State of Iowa to back her, was a different person from the penniless girl with an over-weening ambition to do men's work.

She was sent with the Iowa delegates to the American Dental Association assembled at Chicago ; and there met the different professors of colleges. The Iowa dentists made a formal demand for her admission to college, supported by a threat to withdraw the influence of the State from the one that refused it. The Ohio Dental College granted the request, and she entered the same fall.

Many misgivings were felt by her women friends who feared she could not stand the strain. But she went through with credit to herself and womankind. Professor J. Taft, now of the Michigan State University, then Dean of the Ohio Dental College, wrote in 1886 to the editors of the History of Woman's Suffrage concerning Miss Hobbs: "She was a woman of great energy and perseverance, studious in her habits, modest and unassuming; she had the respect and kind regard of every member of the class and faculty. As an operator she was not surpassed by her associates. Her opinion was asked and her assistance sought in difficult cases, almost daily by her fellow students. And though the class of which she was a member was one of the largest ever in attendance, it excelled all previous ones in good order and decorum—a condition largely due to the presence of a lady. In the final examination she was second to none."

Dr. George Watt, Professor of Chemistry in her Alma Mater, writes of Dr. Lucy Hobbs Taylor, "She is a credit to the profession of her choice and an honor to her Alma Mater. A better combination of modesty, perseverance and pluck is seldom if ever seen."

So the first battle was fought and won. But mark the contrast between the close, conservative East and the broad, generous West. The Eastern professors wanted to change their by-laws so that the women could not attend their associations. The Western professors attacked them through the dental journals and they had to yield the point. Then and there woman's recognition in the dental profession was made complete.

For eight years Dr. Lucy Hobbs Taylor was the only woman dentist in the world. But the dental journals relating her experience crossed the ocean. By these the desire of a German woman in Berlin to study dentistry strengthened into purpose, and Henriette Hirschfeld crossed the waters for the opportunities her native land denied her. She came to Philadelphia supposing that all colleges were open to women. She was disappointed.

However, *she* had wealthy friends who were also influential, and admission was reluctantly granted by the Pennsylvania College of Dental Surgery, from which she graduated in 1869. She returned to Germany and has been a successful practitioner, as well as a noble woman.

Shameful as it is to relate, the truth is that the students, at first, were very ungentlemanly in their treatment of Miss Hirschfeld, but they were finally won by her worth, and ladylike deportment. As late as 1872 and 1873 women were mistreated at this college. But that time has passed and most dental colleges in the United States admit women.

The struggles of these first women opened the way to a lucrative profession now practiced by several hundred women in the United States, as well as by a large number in foreign countries.

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# DENTAL LEGISLATION.

## An Act to Regulate the Practice of Dentistry in Arizona.

*Be it Enacted by the Legislative Assembly of the Territory of Arizona:*

SECTION 1. That it shall be unlawful for any person, who is not at the time of the passage of this Act, engaged in the practice of dentistry in this Territory, to commence such practice unless such person shall have received a license from the Board of Examiners, as hereinafter provided for.

SEC. 2. The Governor of the Territory shall appoint, after the passage of this Act, five (5) skilled dentists of good repute, residing and doing business in the Territory, who shall constitute a Board of Registration in Dentistry.

But no person shall be eligible to serve on said Board unless they have been regularly graduated from some reputable dental college, duly anthorized to grant degrees in dentistry, or who shall have been actively engaged in the practice of dentistry for a period of ten (10) years previous to appointment.

SEC. 3. The length of term for which the members of said Board shall hold office shall be three (3) years, except that two of the members of the Board first to be appointed under this Act shall hold office for the term of one (1) year, two for the term of two (2) years, and one for the term of three (3) years respectively, and until their successors shall be duly appointed and qualified.

In case of a vacancy occurring in said Board, such vacancy shall be filled by the Governor in conformity with Section 2.

SEC. 4. Said Board shall choose one of its members President and one Secretary and Treasurer, and it shall meet at least once a year, and oftener if it shall be deemed necessary.

Four of said Board shall constitute a quorum.

The proceedings of said Board shall at all reasonable times be open to public inspection.

SEC. 5. It shall be the duty of each person now engaged in the practice of dentistry in this Territory, to within ninety (90) days after the passage of this Act, to send an affidavit to the Secretary of said Board, setting forth his or her name, place of business, post office address, the length of time they have been engaged in the practice of dentistry in this Territory; if a graduate of a dental college, state the name of college; and shall pay to the Treasurer of said Board the sum of Five Dollars ($5), for which they shall receive from said Board a practitioner's certificate.

On failure to comply with the provisions of this section they shall be required to appear before the Board and be examined by said Board.

SEC. 6. It shall be the duty of all persons not holding diplomas, who wish to engage in the practice of dentistry in this Territory, after the passage of this Act, to appear before said Board at a regular meeting and pay into the Treasury of said Board the fee of Twenty-Five Dollars ($25), not returnable, and stand an examination by said Board in operative and prosthetic dentistry, and all the branches taught in a reputable dental college, and if such applicants pass an examination satisfactory to said Board, said Board shall issue to said applicant a license which will entitle him or her to practice dentistry in this Territory.

SEC. 7. It shall be the duty of all persons holding diplomas, who wish to engage in the practice of dentistry, after the passage of this Act, to present or send to the Secretary at the regular meeting of said Board an affidavit and diploma with fee ($5), not returnable, and after said Board being satisfied that said diploma belongs to said applicant, and that it was issued in good faith by a reputable dental college, said Board shall issue to said applicant a certificate of registration for said diploma.

SEC. 8. All persons receiving a certificate to practice under this Act shall register his or her certificate with the County Recorder of the county in which he or she resides, and shall pay to the County Recorder for such registration, the sum of Two Dollars ($2).

Any failure on the part of any person holding such certificate to comply with the first part of this section within thirty days (30) after receiving certificate, shall forfeit said certificate, and any certificate once forfeited shall not be returned by said Board until applicant shall have paid to said Board the fine of Twenty-Five Dollars ($25).

It shall be the duty of each County Recorder, to forward to the Secretary of said Board the names of all persons having registered their certificates with them.

SEC. 9. It shall be the duty of said Board to cause to be kept a record of all its proceedings, and the names and addresses of all persons qualifying under this Act.

An annual report of the same shall be rendered to the Governor.

All moneys received by the Secretary under this Act shall be used for the legitimate expenses of said Board, but in no case shall any money of the Territory be used for that purpose.

SEC. 10. Any person or persons violating any provisons of this Act shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than One Hundred Dollars ($100) nor more than Two Hundred Dollars ($200), or confined six months in the county jail, or both, for each and every offense.

All fines recovered under this Act shall be paid into the common school fund of the county in which such conviction takes place.

SEC. 11. It shall be the duty of the Prosecuting Attorney of each county to prosecute such cases when brought to his knowledge.

SEC. 12. That nothing in this Act shall be construed so as to interfere with the rights and privileges of resident physicians and surgeons in the discharge of their professional duties.

SEC. 13. This Act shall take effect immediately after its passage.

Approved April 3, 1893.

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# SELECTIONS.

## How to Avoid Taking Cold.

BY CHAS. A. HOUGH, M.D.

To those who "take cold easily" the usual caution against draughts and damp feet is inadequate. Such persons seldom suffer from a known imprudence. Little keyhole draughts and "trifling" exposures, like little sins, which no remorse attends or cures, are most dangerous to delicate persons. These slight causes of disease, which are harmless to robust persons, can never be entirely avoided, and it is only by increasing the body's power of resisting such influences, that this unfortunate susceptibility to colds may be cured. This power of resistance may be cultivated. Autumn is the most favorable season for such treatment and the cure may be wrought at home and without expense.

The skin is much more than a mere covering to the body. It might be said to represent in its structure, and to supplement in functions almost every organ of the body. The blushing cheek tells how intimate is the relation of blood supply to nervous impression. So richly supplied with blood vessels that it may at one time contain a large proportion of the entire blood; so intimately related to the vital processes that a burn of even slight severity extending over more than three-fifths of the body is generally fatal, and so delicately sensitive that differences in weight of seven to fifteen grains, and variations in temperature of but one-half degree are perceptible, we need not wonder that through our skin we are profoundly influenced by our surroundings.

The influence of cold upon the skin causes a temporary blanching of the surface; the minute blood vessels contract; the blood recedes and accumulates in deeper and more protected structures. That which immediately follows this first chilling is wherein the person of robust health and the one who "takes cold easily" differ so widely. Immediately following the blanching should be a return flow of warm blood to the exposed part, the skin becoming rosy, warm and doubly fortified against chill. The delightful glow which follows bathing a part of the body in cold water is an example of what should follow exposure. Reaction often follows so quickly that stepping from the house into cold wind or rain appears to call an immediate glow to the face, and warmth to the entire body. Persons who are endowed with this power of rapid reaction enjoy boisterous weather and have little fear of evil consequences from an ordinary exposure.

Vastly different is the lot of their unfortunate fellows who take cold easily. Even a slight chilling of the skin produces effects which may ultimately be serious. The circulation, usually sluggish and insufficient in quantity, is profoundly disturbed. Blanching of the exposed portion of the body is pronounced. The skin becomes relaxed, white, moist and cold, or the condition called "goose-skin" may be present. This local condition persists possibly for hours. The nervous system is profoundly impressed; general chilliness, indisposition, both physical and mental, frontal headache, aching of the limbs, general soreness —in short, what physicians call general malaise, or "ill ease," indicate an imminent illness. All these results attend because there is failure to react at the point of exposure.

Now, it is by cultivating the power of reaction that delicate persons may lessen their liability to colds. Multiplying wraps, increasing the weight of clothing ordinarily worn, and hermetically sealing and overheating the living-rooms are all wrong.

Prompt reaction presupposes pure blood and plenty of it circulating in a healthy skin. Pure blood can only be made from proper food—not medicine—assimilated during exercise, either active or passive in pure air not too warm. A healthy skin is, first, a clean skin, one from which all the organic debris has been removed by thorough washing. Too frequent bathing consists in moistening the greasy impurities and then distributing them evenly over the surface—much as we polish a shoe. So long as the moistened hand will rub up any thing from the skin it is not clean.

Next, the skin should be elastic, firm-textured and muscular. Every little hair follicle, each of the myriad glands and all the minute blood vessels with which the skin is so abundantly supplied are surrounded by tiny muscles which have an important role in the processes of life. Unless these muscles be strong, active, quick to respond to demands made upon them by their accompanying nerves, the skin is sluggish and reaction can not be prompt and efficient. These, in common with all muscles, require exercise to keep them in proper tone.

Such a skin as I have attempted to picture may be cultivated, just as quickness of perception, and muscular strength and dexterity in other parts come by exercise.

This may strike one as a novel proposition, but it is absolutely true that the most efficacious means of cultivating immunity against colds is in exercising the skin and habituating it to those changes of temperature and humidity which no one can hope entirely to avoid.

If the reader will give but one month's trial to the plan of treatment I am proposing further argument will be unnecessary.

First, keep your skin clean by frequent, thorough, energetic bathing, followed by much friction. If you are in reach of a competent masseur employ massage occasionally, until your skin acquires elasticity, and becomes hardened to rather harsh usage.

Immediately upon rising move leisurely about the chamber for a few minutes, day by day increasing the exposure of the body, until soon you can take an air bath of five or ten minutes' duration without discomfort. This exposure should always be followed by brisk rubbing before dressing. Soon you may venture to dampen the entire body, by rubbing with the hand moistened in water which has stood exposed over night and is nearly the temperature of the room. Next, use a sponge slightly moistened; then one which is not so dry. Soon you will be taking with impunity and enjoying a sponge bath, which may become more prolonged and more beneficial as the skin becomes habituated to it.

But do not forget that these baths are to be followed, in all cases, by brisk and prolonged rubbing and kneading of the skin, and are not to take the place of the thorough cleansing bath taken at some other time of the day.

These morning baths are merely skin gymnastics, beneficial in that they harden it and increase its power of reaction. As the weather becomes colder with advancing autumn, gradually the morning temperature of your room and the water which you use for your ablutions become lower, and when you are habituated to them, you may venture to open the windows a little on the warmer mornings, and expose the nude body to a slight draught.

During the night the mucous membrane should be hardened by leaving the chamber windows open, to the extent they should have been during the summer, guarding only against draughts or exceptional falls of temperature.

During the day remain out of doors as much as the weather will permit, and resist the impulse to put on unduly heavy clothing.

I would not be understood as deprecating ordinary prudence at any time. Keep the feet dry and warm, and the body dry at all times; avoid violent changes and the long continued cooling of a single portion of the body; remember that the draught through a two-inch aperture, if it strikes the person, is more dangerous than the wind through an entirely open window;

I believe that often the Thanksgiving dinner is as active in causing a cold as are "chill November's surly blasts" outside; persevere in the course of training laid down, and you will find that what must be endured may be largely curtailed by fortifying against it.

## Dentistry in China.

BY J. G. KERR, M.D., CANTON, CHINA.

Abstract of a paper read before the Ohio State Medical Society, June, 1893.

In the department of dentistry the Chinese have, strange to relate, anticipated by centuries the profession in Europe and America in the insertion of artificial teeth. Utilizing the femur of an ox, and sawing a circle of half or three-quarters of an inch from the shaft, a section of this circle is used sufficient to fill the vacant space in the mouth. The section of bone is then dressed with a file, so as to imitate the teeth to be replaced, and through holes drilled in each end, copper wires are passed to fasten it to the adjoining teeth. These artificial teeth are designed more for good looks than for purposes of mastication, and since the cost of inserting three or four teeth amounts to about twenty-five or thirty cents, this means of remedying uncomely defects is within the reach of all.

American and English dentists of high standing have practiced their profession in Hong Kong, Shanghai, and other cities open to foreign commerce, and have employed Chinese young men to assist in the mechanical part of the work. With the talent for imitation for which the race is noted, these young men have not been slow to avail themselves of the opportunity of learning the more delicate parts of the work performed by the dentist himself. A number of these young men have become successful practitioners among their own countrymen, and with foreign instruments and material, are superseding the crude and unsatisfactory work of the native artists. They have not yet attained to the skill in the treatment of diseases of the mouth which requires scientific knowledge, but that will come in time.

The theory that toothache depends on the presence of worms in decayed teeth is universally believed, and is demonstrated by a process peculiarly Chinese, and which was investigated some years ago by Dr. Rogers, a dentist of Hong Kong, and myself. The native operator holds back the lips with a wooden spatula while he works around the offending tooth with a pointed instrument until there is a flow of saliva and blood; adroitly turning the spatula and placing the other end in the mouth, a piece of delicate paper attached to one side is moistened by saliva and the worms, confined under it, are liberated, and become mixed up in the bloody saliva. With a pair of forceps the operator picks them out and satisfies the patient.

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## Use of Cocaine.

1. Amount of cocaine used must be in proportion to extent of surface it is desired to anæsthetize. In no case should the quantity exceed one grain and three-quarters.

2. Cocaine should never be used in cases of heart disease, pulmonary disease, or in persons of highly nervous temperament.

3. In injecting cocaine, the intradermic method is preferable to the hypodermic. By injecting into, not under mucous membrane or skin, the risk of entering a blood vessel is avoided.

4. During injection the patient should always be in a recumbent position; in operations upon the nose and throat, the head should not be raised until anæsthesia is complete.

5. It is of great importance that cocaine should be pure, since its combinations with certain other alkalies result in poisonous compounds.—*Brooklyn Med. Journal.*

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## Diagnosis of Hereditary Syphilis.

Fournier insists that the diagnosis of hereditary syphilis must be based almost exclusively upon ocular evidence. Beyond a family history of infantile polymortality, verbal information has but little significance. To Hutchinson's triad of symptoms—

notched teeth, interstitial keratitis, and inflammation of the middle ear—must be added three other important evidences of specific trouble that do not always receive sufficient emphasis. First, the general appearance of the patient; next, the cicatrices upon the skin and mucous membranes; and, third, the deformities of the bones. Persistent childhood best decribes the bodily condition, owing to the low stature and slight frame. The scars upon the skin and mucous membranes present four definite characteristics: their size, configuration, area and locality. They are very small, almost minute; in form like a rounded bow, an arcade, or a serpentine curve. They are arranged in groups joined at the side, and are found at the commissure of the lips, about the circumference of the nose, in the throat, and particularly upon the buttocks and in the lumbar region. In the bony skeleton are the most strongly marked, the most profound and persistent lesions, easily discovered in the skull, in the face, in the bones of the extremities, most notably in the tibia. The forehead bulges outward, or may be keel-shaped, or may present symmetrical protuberance. There is often marked increase in the transverse diameter of the head, and the lateral halves of the cranium often show marked asymmetry. The characteristic deformity of the face is that of the nose. In the first type the upper part of the nose seems to have fallen in, and the tip turns up; in the second, the lower portion of the nose is shortened, and appears in some way to be absorbed into the upper part. There are also less typical nasal deformities, as when the nose is flattened at the base or badly formed, the result of simple dystrophy, and not of necrosis. Protuberances and hyperostoses are found at the level of the epiphyses, especially noticeable at the upper extremity of the tibia and the lower extremity of the radius and ulna. But the tibia is the direct revelation of syphilis. Its form alone will reveal this disease. It is large, thick, and misshapen, much widened and depressed in its middle portion. The crest is so much increased in size as to present a plane face. In general effect the bone is like the blade of a sword. This conformation is never found in any condition other than hereditary syphilis, of which it is the pathognomonic sign. Chronic lesions of the testicle are of frequent occurrence.

This, together with a history of middle-ear trouble, interstitial keratitis, notched teeth, small scars upon the skin and mucous membrane, the imperfections of the bony skeleton, the arrest or anomalies of bodily development, and the special condition of the tibia, render the retrospective diagnosis of hereditary syphilis comparatively easy. —*N. Y. Medical Record.*

## Origin and Meaning of the Term "Biology,"

The word "biology," which is now so familiar as comprising the sum of the knowledge which has yet been acquired concerning living nature, was unknown until after the beginning of the present century. The term was first employed by Treviranus, who proposed to himself as a like task the development of a new science, the aim of which should be to study the forms and phenomena of life, its origin and the conditions and laws of its existence, and embodied what was known on these subjects in a book of seven volumes, which he entitled *Biology, or the Philosophy of Living Nature.* He desired to found the new science on the fundamental distinction between living and non-living material. In discussing this distinction, he takes as his point of departure the constancy with which the activities which manifest themselves in the universe are balanced, emphasizing the impossibility of excluding from that balance the vital activities of plants and animals. The difference between vital and physical processes he accordingly finds, not in the nature of the processes themselves, but in their co-ordination—that is, in their adaptness to a given purpose, and to the peculiar and special relation in which the organism stands to the external world. He defined life as consisting in the reaction of the organism to external influences, and contrasts the uniformity of vital reactions with the variety of their exciting causes. This idea suggests "the idea of organism" as that to which all other biological ideas must relate. It also suggests, although perhaps it does not express it, that action is not an attribute of the organism but of its essence—that if, on the one hand, protoplasm is the basis of life, life is the basis of protoplasm; their relations to each other are reciprocal. We think of the visible structure only in connection with the invisible process.

The origin of life—the first transition from non-living to living—is a riddle which lies outside our scope. No seriously-minded person, however, doubts that organized nature as it now presents itself to us has become what it is by a process of gradual perfecting advancement, brought about by the elimination of those organisms which failed to obey the fundamental principle of adaptation which Treviranus indicated. Each step, therefore, in this evolution is a reaction to external influences, the motive of which is essential as that by which, from moment to moment, the organism governs itself. And the whole process is a necessary outcome of the fact that those organisms are most prosperous which look best after their own welfare. As in that part of biology which deals with the internal relations of the organism, the interest of the individual is in like manner the sole motive by which every energy is guided We may take what Treviranus called selfish adaptation—*Zweckmassigkeit fur sich selber*—as a connecting link between the two branches of biological study. Out of this relation springs another, which, I need not say, was not recognized until after the Darwinian epoch—that, I mean, which subsists between the two evolutions, that of the race and that of the individual.

Biology naturally falls into three divisions, and these are even more sharply distinguished by their methods than by their subjects, namely: Physiology, of which the methods are entirely experimental; morphology, the science which deals with the forms and structure of plants and animals, and of which it may be said that the body is anatomy, the soul development; and, finally, œcology, which uses all the knowlege it can obtain from the other two, but chiefly rests on the exploration of the endless varied phenomena of animal and plant life as they manifest themselves under natural conditions.—J. BURDON SANDERSON, M.D., in *British Med. Journal.*

# EDITORIAL.

## An Interesting Case.

Have just removed from the mouth of Miss B. M—, who is eleven years of age, the first superior temporary cuspid on the left side. The incisors, bicuspids, and first and second molars, all of the permanent set erupted—this is the only temporary remaining. The permanent cuspid was erupted about one-half of the crown through the gum, about one-fourth of an inch posterior to the lateral incisor of that side, somewhat turned on its axis, it had grown and erupted in such a way as not to come in or near the root of the temporary cuspid, as a result of which the root is intact, not a particle of absorption or wasting of the root having been made; showing very clearly that the coming of the permanent tooth exercises an influence in the removal of the roots of the temporary. There was no disease of the gums near about this tooth nor any of the teeth in the mouth, everything seemed to be in a state of perfect health so far as the gums and sockets of the teeth were concerned. I have seen many such cases, but have never yet seen an instance in which the roots of the temporary teeth were absorbed when the corresponding permanent tooth was so far out of place as to have no influence upon the temporary. If in any case the roots of the temporary teeth have been found absorbed under similar conditions, or in the absence of the permanent teeth, we would be thankful to be advised of the fact.

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## An Inquiry.

The following inquiry has just come to hand, which we here with give, with a remark or two, hoping that it may draw out the experience of others on the points here suggested. The inquiry is as follows:

"Have you ever met with serious disturbances following operations upon the teeth or the wearing of badly-fitting plates—such disturbances, for instance, as facial spasm, or lingual spasm, or masticatory spasm? Have you read of such anywhere? I should be greatly obliged for an answer. F. P."

In reply to the above inquiry we may say, that affections of either an inflammatory or neuralgic character may attend or follow improper or unskillful operations upon the natural teeth, as has been witnessed in many instances. It is frequently the case that inflammatory conditions are occasioned by ill-fitting plates; neuralgic affections do not often occur from this cause, but sometimes do.

In a recent case in which a continuous gum denture for a lower jaw was inserted, though no abrasion or inflammation was anywhere apparent, yet when the piece was placed in the mouth, though to all appearances a well-fitted plate, there was severe pain after it had been worn a short time, so that its use had to be abandoned, and return to the use of the old plate, which was much less perfect in its adaptation.

We have known a few cases of this kind, they do not, however, often occur.

Inflammation of the mucous membrane and soft parts of the mouth is of very frequent occurrence from ill-fitting plates; usually this occasions complaint and remedy, but in many instances the irritation comes on so gradually and almost imperceptibly as to inure the patient to the inconvenience till now and again serious conditions are established.

Another inconvenience that is experienced by this wearing ill-fitting plates, is defective mastication and insalivation, and a corresponding inefficiency in the digestive and nutrient processes.

This is a subject to which far more attention should be given by our profession than it has hitherto had. We trust this suggestion will elicit such attention as will cause every such case to be investigated and studied.

## The Ohio State Dental Society.

The annual meeting of the Ohio State Dental Society was held in the Neil House, Columbus, December last, 5th, 6th and 7th.

There was present a larger number of the membership than for several years, and a warm interest was manifested in its work and prosperity. Quite a number of papers were read and discussed, which will appear in the next number of the REGISTER. The papers were all good. We would direct attention especially to the papers of Drs. J. R. Callahan and G. Molyneaux. The former on "The Use of Sulphuric Acid in Opening and Cleansing Pulp-Chambers and Root-Canals." The process was certainly new to many, and in the discussion which followed, and the demonstrations presented, great interest was manifested. It is a method of procedure, for the purpose specified, that will certainly call forth special attention from the profession, and doubtless will add very greatly to the facility in this line of work. Opening and cleansing and putting in proper condition root-canals of pulpless teeth has to the great proportion of the profession, at least, been an operation attended by very great difficulty, and many a time with uncertain success. According to the experience of Drs. Callahan and Heise, extending over three or four years, it is pretty conclusively shown that more can be accomplished by this method of procedure than by any that had preceded it.

The paper of Dr. Molyneaux on "Arranging and Articulating Artificial Teeth, especially full Dentures, with the Articulator devised by Dr. Bonwill" showed marked progress in this direction. By nearly all methods of articulating artificial teeth heretofore employed, or at least, prior to the introduction of Dr. Bonwill's method and appliance, there was a lack of scientific precision and accuracy that seemed very desirable. The difficulties that attended the arrangement and articulation of artificial teeth seem to be, by the intelligent use of this method, completely overcome.

It is a matter of regret, however, that the discussions upon these papers, as well as upon the others, were not fully reported.

This we regarded at the time, and still regard as a great oversight on the part of the Executive Committee of the Society. We are promised faithfully, however, that this lapse will not again occur. This society is old enough, has done good work enough to have its doings fully recorded, and the profession thereby enabled to derive the benefit from these proceedings. The interest manifested in this meeting is certainly indicative of a more general interest in the work of the society. A large number of new members were added, and one very encouraging feature was that the younger members of the society were inclined and actually did take hold of the work better than ever before. If the profession generally could realize how much strength and encouragement is imparted by attendance at these meetings, the numbers would be vastly increased and more encouragement and stimulus given to all.

We think the hope is fully warranted that the meeting of 1894 will be the largest and the best that has ever been held.

## Mississippi Valley Dental Society.

The annual meeting of this body will be held in Cincinnati early in March next, and we would simply suggest that the officers give the matter attention at as early a day as possible, for this should be a grand, good meeting. Being the fiftieth year of the existence of the society, it should have a semi-centennial meeting that should command the attention of its entire membership and also of the profession outside.

It is to be hoped that the Executive Committee will act promptly, and secure an attractive and interesting programme for that occasion. The Executive Committee is distributed throughout the various neighboring States, and we would suggest that their attention be at once given to this matter, and that they make such preparation as shall result in a meeting worthy of the occasion and worthy of this pioneer society.

The Register will publish any suggestions or plans in reference to the matter from the officers or the Executive Committee.

It is to be hoped that a definite time will be selected that will be most favorable for bringing together the largest possible number; and let all come with a full determination to make this meeting an eminent success, and to give it the entire attention during the time of the meeting.

## Bibliographical.

A PRACTICAL TREATISE ON MECHANICAL DENTISTRY, by Joseph Richardson, M.D., D.D.S. Sixth Edition. Revised and edited by Geo. W. Warren, D.D.S., with six hundred illustrations.

The fifth edition of this work was issued September, 1888. The demand for the sixth edition within five years of that time is a very clear indication not only of the popularity of the work but of its intrinsic merit.

It has, since the issue of the first edition, stood as a treatise upon Prosthetic Dentistry for the student and the younger practitioner at the head of the list of works of this character, and not only for these has it been valuable but for the general and older practitioner as well, as is clearly proven by the frequent reference to it by every practitioner.

The author of the work having passed away since the fifth edition was issued, the preparation of this necessarily fell into other hands, and it is hard to conceive that it could have been better done than it has by Dr. Warren, the present editor, who says, in a note attached: "In preparing the sixth edition of this work, the editor's first effort has been to make it pre-eminently practical as a text-book for students and a guide for young practitioners. Useless methods and obsolete theories have been eliminated; much of the text has been re-written, notably the section on Crown and Bridge-Work. It has also been newly illustrated, bringing the treatise fully up to the time of its publication."

The rapid strides made and continually being made in Prosthetic Dentistry render it difficult to prepare a work of this kind that shall faithfully represent the progress in this direction for more than two or three years. Notwithstanding the basal principles upon which this department of dental practice is based, are quite well established and doubtless will remain, with some modification perhaps, in the long future, but in details, changes are being constantly made; this pertains not only to manipulation and progress, but to materials and their application as well. In this latter particular Dr. Warren has succeeded admirably, and the volume as presented is quite up to the present standing of Prosthetic Dentistry.

A large addition has been made to the illustrations, which adds much to the value of the work. These are very well executed, and add much to the facility of comprehending the text, though it is clear and concise. So large a number of new illustrations have been added that it might almost be said to be newly illustrated throughout.

The department on Crown and Bridge-Work is so fully and so well presented that it would seem almost to render unnecessary any other work on this subject, occupying over two hundred pages of the work.

This edition, as was the case with the others, cannot be too strongly commended to the attention of every member of our profession who desires to keep up with its progress.

The work is published by P. Blakiston, Son & Co., of Philadelphia.

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DISEASES AND INJURIES OF THE TEETH, INCLUDING PATHOLOGY AND TREATMENT. A Manual of Practical Dentistry for Students and Practitioners, by Morton Smale, M.R.C.S. L.S.A., L.D.S., and J. F. Colyer, L.R.C.P., M.R.C.S., L.D.S. Published by Longmans, Green & Co., London and New York.

The above work has just come to hand. Opportunity has not yet been afforded to give it sufficient examination to speak definitely of its merits. Judging from the reputation and standing of the authors and a hasty glance at its contents, we are favorably impressed with the work; we will, however, have more to say upon it after a fuller examination.

THE DENTAL REGISTER.

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# SOCIETY PROCEEDINGS.

## World's Columbian Dental Congress—1893.

### SCIENTIFIC WORK BY SECTIONS.

Reported for the DENTAL REGISTER by Mrs. J. M. Walker.

### SATURDAY, AUGUST 19TH.—SIXTH DAY.—GENERAL SESSION.

(*Continued from page* 28.)

The meeting was called to order at 11:00 A. M., by the President, and the Secretary-General read the following resolution from the Executive Committee:

"*Resolved*, That the thanks of the members of the World's Columbian Dental Congress be extended to the Hon. C. C. Bonney, President of the World's Congress Auxiliary; Clarence E. Young, Secretary; and Eugene J. Hazard, Private Secretary to Mr. Young, for the courtesies shown us during our stay in Chicago."

The reports of the following committees were read by title, and will appear in the volume of Transactions of the Congress, viz: Committee on the History of Dental Legislation in This and Other Countries, Wm. Carr, M.D., D.D. S., New York, Chairman.

Committee on the Care of the Teeth of the Poor, by T. H. Parramore, D.D.S., Hampton, Va., Chairman.

Communication on the Dental Use of Cocaine, by Dr. Viau, of Paris, France.

The topic for discussion, "What Relation Shall Dentistry Hold to Medicine?" was then taken up.

Dr. J. D. Patterson, Kansas City, Mo., thought the most rapid progress had been made by dentists as an independent profession, without, however, detracting from the fact that dentistry is a specialty in medicine.

Dr. J. Y. Crawford, Nashville, Tenn., would prefer to discuss the question, "What Relation Does It Hold to Medicine?" That it is a part of the healing art there can be no question. He thought there ought to be a well-equipped section in dental and oral surgery in every medical organization in the country. By bringing together those who are earnestly working for the advancement of the healing art in general and men who are capable, from a dental standpoint, of impressing upon the medical profession the importance of dental surgery, we should get the full recognition of the idea that dentistry is of a piece with hygiene from beginning to end, and that the perpetuation of civilization depended largely upon it. Dentists should be more thoroughly prepared for the treatment of all facial injuries than many of them are.

The subject was passed after a brief discussion.

The report of the Committee on Prize Essays was presented, awarding to Dr. George Cunningham, of Cambridge, Eng., the prize for the best essay on Oral Hygiene, and recommending that the medal be awarded to him.

The President, with a few fitting remarks, pinned the medal on the lapel of Dr. Cunningham's coat, stating that it would be suitably engraved. The medal consisted of a gold bar to which was suspended a plate, the token being of solid gold throughout.

Dr. Cunningham very feelingly expressed his gratification at having received the prize.

Dr. Godon, Paris, France, and Dr. Florestan Aguilar, Cadiz, Spain, offered resolutions signed by the different foreign representatives, expressing their thanks to the different members and those connected with the Congress for the many courtesies received.

The total registration was announced as 116 foreign and 999 American—total, 1,115.

The Chairman of the Executive Committee having been called away,

Dr. J. Taft, Cincinnati, was called upon to address the meeting as the representative of the Executive Committee. He said the work done by the Executive Committee had necessarily entailed much anxiety and great labor. Under the most favorable circumstances there would be anxiety in the minds of those who had such a work in charge; there were adverse circumstances to overcome, some actual, some which threatened greater obstacles than really presented. In the main, these have all cleared away, and we have a grand and undisputed success, and a far greater attendance than was anticipated. Even the financial troubles that have swept over our country have not been sufficient to prevent the grand success which has been achieved. It was thought that from five hundred to eight hundred members was all that ought to be expected, in view of the financial troubles, but we have had between eleven and twelve hundred members present. We are gratified that a large number are here from other countries. I voice the feelings and the sentiment of every American when I say that it is a matter of great gratification that we have been permitted to welcome so large a number of our professional brethren from all over the world.

What will be the outcome of this great work? I look upon it as prophetic of increased interest and rapid progress of our profession. Who would have attempted fifty years ago, or even twenty-five years ago, to prophesy such advancement and progress as has been made in the profession? Who can tell what the progress and the attainments shall be in the next twenty-five or fifty years? We dare not prophesy, but we are justified in saying that there will be an upward and a forward movement, and a richer development than has been realized. New things will arise, perhaps in the near future. Let us work on. Let this be a stimulus for us to go forward and do more and more. The door of opportunity is open wider to-day than it has ever been, and we should enter and occupy to the fullest extent that which is before us.

Our sisters, our lady friends, have had a door open to them through which they have entered into this profession. Is this not prophetic of onward movement? People sometimes criticise the entrance of women into this profession, just as they caviled and criticised when women entered the medical profession years ago. I believe that the ladies of the profession will do work that the men have not done. They will look more to the hygienic aspect. They will have more sympathy for the children, and they will look more to the oral diseases of children, more to prophylactic and hygienic efforts that may be made for the rescue and preservation of the little ones from attacks of disease.

Ladies and gentlemen, when we look at what has been done here, when we remember the fact that a larger number and a higher effort has been made here during this week in behalf of dental science than ever before, we should be very proud. If another Congress seems proper, let us have it. The profession is able and capable of doing a great work, and it may be that a greater work than this will be accomplished in the future.

The President of the Congress, Dr. L. D. Shepard, in his closing address, briefly recounted the labors of each of the committees, to whose labors much of the success of the Congress was due, and expressed his appreciation of their faithful, efficient, unselfish discharge of the duties intrusted to them.

He said: It may be truly said that the work done in this Congress has been most extraordinary. Usually, when there are side-shows or outside attractions, people are taken away from the dry and less exciting professional work of the meetings; but, notwithstanding the marvelous attraction so near us, the meetings in this hall have been well attended, the clinic rooms have been thronged, and the Section rooms have been crowded. I think, under the circumstances of the extraordinary counter-attractions, the attendance of so large a number of members at the sessions deserves special mention, and shows that they came here for dentistry first, and have attended to it, while they were here. The very wise and thoughtful provision made for carrying on the work, by those in charge, is the cause of the success of this Congress.

While no one could be more conscious of the honor which this position brings with it, there is also the consciousness that there are many other American dentists who have done infinitely more for the advancement of this country, and of the world. We have members who are known throughout the world as original, scientific investigators, and their names will live in history, not as presiding officers, but as workers in the fundamental fields of research which make true progress. The President is in this Congress but a figure-head for the expediting of the transaction of the business which has been planned by others, and he desires personally to thank every member for the kindness he has received at their hands.

The friendships which have been made here will last through life. We have met the eminent men of the profession from almost every clime; and friendship, the result of personal meeting and personal converse, is an immense factor in progress. For the kind resolutions which were passed in behalf of the American members of the Congress, we return our thanks that those who have come from afar have enjoyed themselves, and can tell us truly that while the record has been passed of the biggest meeting, the more valuable record of the largest work of progress has also been made.

We appreciate the kindly words of our foreign friends, and trust as they go to their homes that success will attend them, and as the American dentist, who is a great traveler, shall visit their homes, we know that the warmest kind of welcome will await him at their hands.

Gentlemen from abroad, we are glad you came. We have enjoyed your company, and the bright thoughts and valuable instruction which you have brought to add to what has been gathered from our own shores, and we heartily indorse the movement that in future an exigency like the present shall be the motive for the formation of another World's Dental Congress.

There is nothing now for me to do but, by the authority conferred in me, to declare this World's Columbian Dental Congress adjourned *sine die*.

At the conclusion of the session, a photograph of the gathering was taken in the hall, after which the members separated, and the World's Columbian Dental Congress was at an end.

In addition to the eight sections, the daily work of which has been recorded, what might be termed Section 9, "Histology and Microscopy," held two night sessions, with lantern exhibits.

On Wednesday evening, Dr. R. R. Andrews, Cambridge, Mass., delivered a lecture, illustrated by photo-micrographs, entitled, "A Contribution to the Study of the Development of the Enamel."

This paper embodies the result of Dr. Andrews' investigations subsequent to the paper presented by him before the Dental Section of the Tenth International Medical Congress at Berlin, in 1890.

He said: My studies since then lead me to believe that there exists in the young developing enamel, something that has the appearance of fibers, guiding and sustaining the globules that are excreted from the enamel-cells which are to form the future enamel-rods, upholding and supporting them.

After citing the views held by John and Charles Tomes, Dr. J. L. Williams, Prof. W. X. Sudduth, Kolliker and Klein, he said: Some little time after finishing my former paper on "Enamel, Its Development and Calcification," I read it to Prof. E. L. Mark, of the Biological Department of Harvard University. He stated that I had found and demonstrated new points about the enamel that a German investigator had also recently described; that both papers gave similar views. At my request he translated the paper from the German journal in which it was published. Its title was, "On the First Processes of the Deposition of the Enamel," by Dr. Graf Spee. The description he gave of this process was so nearly like my own, that I read it with considerable surprise.

I did not know that any one had described the enamel-rod as being formed by minute globules coming through the cell. But he had seen these minute and highly refractive globules in the body of the cell, and says that when the tissue is properly prepared—and he lays great stress on this point—they are always to be found there at the time of the formation of the enamel. Their entire absence at earlier stages is an indication that these globules are an enamel substance. He gives to them the name "enamel-drops," and says he saw these "enamel-drops," when enamel is to be formed, appear only in the half of the enamel-cell which rests on the dentine; afterward, farther up in the cell, but not quite up to the region of its nucleus. Dr. Spee's "enamel-drops" were really what I described as minute calco-spherites, which, merging together, had formed large globules, of a substance which I believed to be calco globulin.

He spoke of a paper by J. Howard Mummery, entitled, "Some Points in the Structure and Development of Dentine," read before the Royal Society, March 5, 1891, saying, "appearances noted and demonstrated by Mr. Mummery in this paper recalled to my mind similar appearances which I had seen in the developing enamel, appearances that I could not then explain, that I did not understand. As some of his results will be of interest to us, while considering this subject, I shall try and give a brief idea of them."

After summarizing Mr. Mummery's paper, and describing the processes by which the specimens to be presented had been obtained, he said: To sum up my conclusions: I am led to believe that there probably exists in developing enamel, as has already been found in developing bone and dentine, a fibrous sub-structure on and between which the enamel is deposited. After the enamel is wholly formed, its existence seems to be wholly blotted out in the dense calcification of the tissue. In sections of wholly-formed enamel, I have never been able to trace it, although I have tried the methods of those who claim to have seen it. In regard to a beaded protoplasmic reticulum of living matter in formed enamel, I have never been able to find it. I believe with Klein, that it is improbable that nucleated protoplasmic masses are contained in the interstitial substance of the enamel of a fully-formed tooth.

This paper was passed without discussion, and was followed by a lecture by Dr. W. X. Sudduth, Minneapolis, Minn., also illustrated by lantern slides, "On Some of the Forces that Influence the Form of the Jaws and Teeth During the Process of Development."

In discussing the subject of the evolution of the teeth it is essential that there shall, at the outset, be a full understanding regarding the relationship of tooth and jaw, as the environment of the tooth has much to do in its formation.

A tooth in its early stages of development is wholly composed of soft tissues, and lies in a bed of embryonal connective tissue, constituting the fœtal jaws.

This easily compressible matrix is bounded on the outer side by the cheeks and lips which tend to compress the jaw and hold it firmly against the tongue. The shape of the fœtal jaw depends, to a very great extent, upon the form of the tongue, a pointed tongue giving a pointed arch, while a blunt tongue will give a correspondingly shaped one. From this it will be seen that even before there is any osseous development the form of the arch is, to a great extent, determined by the environment of the jaws.

Before the tooth assumes definite form ossification of the maxillæ begins, and each germ is separated into its own alveolus, so that even as early as the third month of gestation the type of the jaws is established. The development of bone in the jaws proceeds in the substance of the soft, connective-tissue matrix in such manner as not to disturb the form of the arch established in the first month of gestation.

The successive stages of tooth development and the influences guiding their respective forms were traced to the time of eruption and root-formation. He said, anything that interferes with the normal process of development will necessarily leave its impress on the crown in the shape of malformations. This is so well known that it need not be discussed in this connection. Suffice it to say that congenital syphilis, rachitis, scrofula, all the exanthemata and pathological processes, in connection with the absorption of the roots of the temporary teeth, are among the several factors that pathologically influence the form of the crowns of the teeth. Faulty nutrition, from whatsoever cause, results in poorly calcified and malformed teeth in a great variety of forms.

The effect of use and disuse, and the indirect influence of environment were next considered, and the changes which may and do occur in the form of the teeth as the result of the action of the law of "variation," whereby additional cusps are formed and other similar changes which are subject to inheritance.

A portion of the lecture was given to the change in form of the jaws as the result of artificial selection in animals under domestication, where the position of the teeth in the jaw as well as change in form and even suppression in the number of teeth result, the most marked being the common swine and pug dog.

A series of slides were shown in illustration of the lecture.

Dr. M. H. Cryer spoke of the effects of breeding for "short-faces" upon the pug dog, showing that the teeth became exceedingly irregular, the lower jaw protruding beyond the upper, producing the condition known as "underhung." Their anterior teeth are soon lost for lack of use through non-occlusion, and the posterior molars often are not erupted, and upon dissection of the jaws are found in a rudimentary condition.

At the Thursday evening session Dr. D. E. Caush, of Brighton, Eng., read a paper entitled, "Some Changes that Take Place in and Around the Pulp-Canal."

He said: During the microscopic examinations of exostosed human teeth, my attention was continually drawn to certain alterations in the shape and structure of the pulp-canals; it was an unusual thing to find in an exostosed tooth a perfect pulp-canal, and this led me to the examination of a large number of these teeth. The subject has been under observation about five years, and the deductions drawn are from the examination of between two and three thousand teeth.

The changes noted by the author were various irregularities of outline in the pulp-canals, until, in some cases, the whole of the original outline of the pulp-canals had disappeared, leaving in its place a very irregular canal. The canal was also much enlarged in some specimens, while in others the excavations had extended until a second canal had been formed, frequently passing at right or acute angles to the original canal, continuing until it passed through the dentine into the cemental tissue. These canals were either simple or branched, or instead of canals passing thus at angles to the pulp-canal, the two or three canals of an inferior or superior molar may be united together into one irregular canal.

In all cases where this change has taken place the margins of the canals show a more or less irregular edge, produced by the semilunar excavations of the dentine. A second change more marked even than that of the excavation oftentimes follows, for in these depressions it is not at all unusual to have a deposition of new bony tissue entirely different in microscopic structure from the dentine which surrounds it. In this new tissue we have no tubuli radiating to a given center, as in the ordinary dentine, but in place of the tubuli we have a number of lucunæ and canaliculi, in character somewhat like those found in true cemental tissue.

The irregular margin and semilunar character of the edges give a clue, as to how these changes are brought about, showing that there must have been absorption going on in a greater or lesser degree, according to the amount of change that has taken place.

It is evident (microscopically) that such an edge could not be produced by the addition of new tissue alone, and in cases where secondary dentine is deposited, either as dentine of repair, or as a result of pulp-calcification, for in either of the cases the microscopic structure of the tissue is quite different; in all these cases the new tissue is always added directly to the older tissue without any excavations or absorptions of the original margin, and the secondary dentine is deposited directly from the odontoblastic layer of the pulp. On careful examination of the exterior surface of an exostosed tooth, the first thing to which our attention will be drawn is the thickened condition of the membrane, and it may appear two or three times as thick as it would appear in health, and at certain places under the membrane we may frequently find excavations going on and giant-cells in position; again, in another place in this root we may find some older excavations, and a layer of new tissue filling up the excavations and increasing the size of the exostosed tooth by the additional tissue formed, in fact, the three stages of the development of cemental tissue in exostosis.

The initial point in these changes is, the layer of odontoblasts or lining cells of the pulp-canal, the source of nourishment from the pulp to the dentine. It is from this layer that the secondary dentine is formed, but under certain circumstances the character of the cells forming this layer changes, both in shape and size. Thus, if by such cause as congestion, or slight inflammation of the pulp a greater amount of blood is brought the blood-vessels in the pulp, these cells appear to lose their original shape, and enlarge, the nuclei become active, and new cells are rapidly formed by cell-division. As these new cells continue to form, a layer like the alveolar dental membrane in appearance is produced, and this newly-formed layer presses upon the dentine. The cells in juxtaposition with the dentine begin to absorb the latter, and thus obtain more room for further development. This goes on as long as there is an abnormal blood-supply to the pulp, and thus owing to either a long or short time of pressure upon the dentine, caused by the excess of formative material brought to the cells by the increased blood-supply, we may have many or few excavations produced, as in the case of chronic inflammation of the pulp, we get many excavations, and oftentimes these excavations penetrate more deeply into the original tissue.

Should the tooth be extracted about this period, nothing but the excavations or the thickened membrane will appear in the pulp-canal. If the tooth is not extracted, the whole of the pulp becomes more or less congested and altered in character; the odontoblastic layer being destroyed, there is little or no intercommunication with the dentine by the tubuli, and at this stage one of two things may occur:

1. The blood-supply becomes normal, the congestion temporarily passes away, and for a short time the tooth is tender to the touch, as if there had been periostitis, and from this stage it gradually becomes comfortable, and remains so until the inflammation again commences, or—

2. The giant-cells change their character, and become formative cells, producing as a result of calcification, a fresh tissue in the canal, in character and in microscopic structure resembling

cementum, developed also from a membrane similar in character to the alveolar dental membrane.

This paper was illustrated by a number of slides, showing the irregular outlines of the canal, the excavations spoken of, the lateral canals, etc.

### DISCUSSION.

Dr. G. V. Black said: It has fallen to my lot to cut a great many of these sections, and to study them and to write upon them, to some extent. Now, there is a number of different calcifications, if I may use that term, occurring in the pulp-chamber. We have the simple dentine, as shown; then, again, occasionally the true dental tumor, growing out of the wall into the pulp-chamber, presenting the canaliculi. The thing we find the most of, and the thing that seems to have been shown mostly upon the screen, is calcification that has occurred as degeneration, which is undoubtedly, to my mind, simple degenerate calcification, such as we have in the arteries, and around the valves of the heart and other parts of the body. These occur very frequently in the pulp-chamber, when, from any cause, either from age or from disease, or abrasions of the teeth, calcification of these organs occurs. This may be attached to the pulp-chamber, as we have seen upon the screen, or may be free within the pulp in various forms; they are not properly tissues, they are simply calcifications of the tissue in a state of degeneration.

Now, as to absorption, some of those long lines running through the dentine, that we have seen on the screen, I am in the habit of determining as blood-vessels included in the dentine. We find these canals shooting out in different directions from the pulp-chamber, and they certainly are the things I have been in the habit of interpreting as forming the vessels in these lateral canals. It is exceedingly rare. We have them abnormally large, and filling up with calcific matter. We may occasionally have them filling up by cementum, and that is rather rare; but the true cementum, having the true characteristics, is a rare thing indeed.

Dr. A. O. Hunt, Iowa City, Ia., said that, in his opinion, all deposition within the body of the pulp would be of a character like cementum, rather than dentine, for the reason that the blood-supply for sustaining it comes directly from the dental membrane.

Dr. Geo. Cunningham, of Cambridge, Eng., read a paper entitled, "Luxation, or the Immediate Method, in the Treatment of Irregular Teeth."

The paper was a description of a number of cases of the immediate method of treating irregularities by luxation, which has been practiced by a number of English dentists. When the slow mechanical means are out of the question, this method may be regarded as filling a niche not previously occupied by any other operative means at our disposal.

The paper was illustrated by a large number of slides, showing various cases related.

In reply to questions, Dr. Cunningham stated that the root of the tooth was moved as well as the crown, though in his opinion the pulp was not capable of being stretched to any great extent. Also that more force was required in this operation than for extraction.

Dr. Jarvie said of this method: He has shown some marvelous results, in which he has moved teeth a quarter of an inch, with the pulps kept alive, and, barring the pain of the operation at the moment, no results that are severe to the patient. Now, if irregularity exists, and the teeth can be made regular by a method that will involve only a few moments pain, it is infinitely better than one that extends over several weeks or months.

Dr. Cunningham further said: In regard to the comparative merits of the slow and the quick methods, I do not consider that I am in a position yet to give a definite opinion. It has been a long time since the first operation, as you will observe, and this is the first time I have brought it before a body of this kind. I have a certain amount of diffidence in bringing forward so simple and easy a way for both the patient and operator. I am not in a position to say that such an operation replaces the older method. I only claim that in these operations I have taken them where the ordinary operations have failed. The slower method is the surer, and at the same time there is an element of hope in this operation which is very great indeed.

Dr. Jarvie: Occasionally cases present themselves in which I wish I could do what Dr. Cunningham has done so successfully, but I have, every time, dreaded to attempt it.

Dr. Cunningham: I am ready to perform the operation at any time, without fear, when the patient has arrived at adult age. Adjourned.

### EXHIBITS.

Among the exhibits made at 102 Michigan avenue, in connection with the Dental Congress, were the following:

Dr. Barrie, Paris, France, exhibited a hot-air injector with four adjustable points for puncturing abscesses, injecting abscesses, enlarging fistulæ, and for ablation of epulitic growths. The instrument is attached to a reservoir containing gasoline, to which there is a bulb attached for forcing air through the reservoir. In use, the point is heated over the flame of an alcohol lamp or Bunsen burner, the heat being kept up by the combustion of gasoline vapor. It is very convenient for drying out teeth or any other purpose to which a cautery may be put.

An electric mallet devised by E. Bidaud, of Paris. This mallet has the interrupter so arranged that closure of the circuit is made when the plugger-point comes in contact with the filling. This secures the delivery of a single blow at the moment when applied, as in the Snow & Lewis automatic, and not a continuous series of rapid blows, as in the ordinary electric mallet. The force of the blows is controlled and graduated from light to heavy at will.

An electric stomatoscope, in which illumination from a small electric lamp, encased in a hard rubber cylinder, is projected through a glass rod, the free terminal end of which, about five to eight centimeters in length, is ground hemispherically in shape, and so acts as a strong convex lens. The light when projected through this rod gives a powerful illuminating effect, and several of these rods, with various curvatures, are provided, so that all parts of the oral cavity, and in fact any of the cavities of the body may be illuminated thereby.

The great advantage of this instrument is the absence of any danger of breakage, or of any appreciable rise of temperature, at the point where the light is delivered.

The universal forceps devised by Dr. Poinsot, of Paris, with changeable beaks. This instrument departs widely from the usual form, as the beaks are not closed by the leverages on the handle, but by a mechanism similar to a monkey-wrench.

Dr. Godon's exhibit of so-called "Immediate Prosthesis" originally introduced by C. Martin, of Lyons, France, was one of the extremely interesting exhibits. One was a hard-rubber piece to substitute for a portion of a jaw and teeth which had been resected on account of disease. This piece was made before the surgical operation, measurements having been made for size and shape. Immediately after the operation the piece was placed in position and screwed to the remaining portion of the jaw. It was simply a temporary appliance to prevent the falling in of the parts where the muscles are inserted, and after being worn a few months, its object being accomplished, it was removed and replaced with a hard-rubber plate and teeth of similar form.

Also soft-rubber vela to be attached to hard-rubber plates for closing fissures in the soft palate. In constructing this apparatus, he dissolves rubber in chloroform and paints it over his matrix or mold. In this way he avoids air-spaces and consequent porosity after vulcanization.

In one case the velum is hollow and subsequently partially filled with water, to make it more adaptable to the soft parts. This is done by vulcanizing it over a plaster core; then the piece is punctured at some point and the plaster removed through the opening, and partially filled with water and closed by means of a disk or washer and screw, by which also the attachment is made to the plate.

Dr. Godon exhibited an artificial tongue made of soft rubber, filled with water. This can be introduced after an operation necessitating the removal of the tongue; it can be slightly used and controlled by the remaining stump.

Dr. Godon presented also several other appliances for removable bridge-work, etc.

Dr. Geo. B. Clement showed a series of slides under the microscope which, he claims, proves that pyorrhœa alveolaris is caused by the calcic infiltration of the cementum, producing calcic hypostasis. His theory is that the cementum while it receives just so much nourisnment as will allow it to retain its natural condition will be healthy, but in case of super-nutrition a condition of inflammation will occur, while in the opposite condition the microscopical vessels of nutrition in the cementum become obliterated by the deposition of lime-salts, and the disease pyorrhœa alveolaris is the result. His specimens showed sections of cementum from healthy and diseased teeth, and seemed to prove the truth of the theory.

Dr. J. W. Penberthy exhibited a new bracket-table. The peculiarity of this table consists in the arrangement of the bottom of the drawers. These are hung on pivots, so that when the drawer is pulled out the back end of the bottom swings down. Holes extend through the bottom to contain the instruments, and when the drawer is extended the points of the instruments are in sight and convenient to the hand.

Dr. J. H. Morrison, of Connersville, Ind., showed a system of punching up crowns from solid plate. By forcing a disk of metal through different-size holes he gets a parallel-sided tube closed on the end. He then about half fills this tube with small shot, places it upon the die-plate representing the coronal surface he desires, and with repeated blows of the hammer the cap is made to take the form of the masticating surface of the tooth. The spreading of the lead gives a bulging shape to the part below the crown.

Dr. Geo. D. Sitherwood, of Bloomington, Ill., exhibited a closed-top oak work-table, suitable for the operating room, for the appliances and materials needed in crown and bridge-work.

This had a roomy space, which accommodated an oxyhydrogen blow-pipe and a porcelain furnace. This part could be closed up like a desk whenever desired. Underneath were two drawers of convenient size.

He also showed specimens of aluminum dental plates.

Dr. C. W. Jones exhibited a root-trimmer and facer for trimming the roots, without lacerating the gum, for there ception of a collar or crown.

Dr. V. H. Jackson showed a large number of casts, fitted with regulating appliances, as described in his paper read before Section 7.

Dr. L. E. Custer exhibited an electrical cabinet for the electrical mallet, hot-air syringe, illuminator, etc.

Dr. J. Austin Dunn exhibited the "Dunn Syringe and the Dunn Hand Matrix."

Dr. H. N. Young exhibited drawings and casts of the jaws of a case of *osteitis deformans*, or *acromegaly.*

Dr. Richards, of Knoxville, exhibited a set of artificial teeth encrusted with young oysters, which were found in an oyster-bed on the coast of North Carolina.

Among other articles exhibited were the following: The Hollingsworth Crown and Bridge System and Appliances, The Berry Electrical Dental Engine, a collection of instruments manufactured in Japan, with the S. S. W. trade-mark on them, Buxbaum's Dentimeter, Pyrozone, by McKesson & Robbins, Harcourt's Dental Engine.

Dr. Geo. Cunningham, London, England, showed a very interesting collection of small muffles and crucibles suitable for his new low-fusing continuous gum.

He also exhibited some artificial teeth, which, by means of the low-fusing body, he had tinted in different shades, showing the value of the process in obtaining the most artistic results in teeth bought at the depots, which were all that could be desired, as to size and shape, but which, in color, lacked the individual characteristics demanded of the case.

Another use for this material was shown in an artificial crown, where the connection between the porcelain tooth and metallic cap was made by the fused body. Pitting, grooving and otherwise marking of the depot teeth in imitation of natural ones in particular cases were exhibited, showing very artistic effects.

There was on exhibition an interesting collection of different pieces of workmanship by Paul Alfred Koelliker, of

Zurich, Switzerland, the most important being an obturator adapting itself to all movements of the soft palate, with gold hinge attachment to a vulcanite plate, a most beautifully executed contrivance.

There were two or three curious specimens of prosthetic work made in Dr. Koelliker's earlier experience. One was a full lower denture made on a base carved from the tusk of a hippopotamus, with natural teeth inserted ; put in the mouth in 1855 and worn continuously until 1867, when it came into his possession upon the death of the patient. Another was an upper denture with English tube teeth in front on a gold plate and hippopotamus blocks for the molars. This piece was put in the mouth in 1870, and is very skillfully done.

Another curiosity in the collection was a partial upper and lower set made of gold and connected by spiral springs, the upper to the lower. It had natural teeth attached, also teeth carved from the hippopotamus, both showing decay which had occurred after being placed in the mouth ; made about 1830.

### DEMONSTRATIONS.

In connection with the clinics at 102 Michigan Avenue, in connection with the Dental Congress, the following demonstrations were given :

Dr. Geo. Cunningham, London, England, showed his process of continuous-gum work with low-fusing enamel and body. Also the staining or tinting of artificial teeth to resemble accidental defects in natural teeth.

Dr. Sitherwood : A method of fusing porcelain around the band of a porcelain crown, which would insure perfect joints and, with proper shading, an artistic result.

A swaged plate of pure aluminum was also shown, and the method of annealing and swaging described.

Dr. Broadbent, Chicago : Bleaching a left superior incisor badly discolored for about a year and markedly affected by pyorrhœa alveolaris. The treatment consists in applying pyrozone, 25 per cent., outside by means of a spray, and on cotton within the pulp-canal.

The pyrozone was applied and rapidly volatilized by means of an air spray.

Dr. C. E. Blake, of California, demonstrated the use of "Muriatic Ether," (ethyl chlorid), as a local anæsthetic, and the use of his new gum-cutting and extracting forceps.

Dr. C. Sill, of New York City, demonstrated the use of vaseline to allay the irritation from the use of oxyphosphate and oxychloride cements. He mixes it with the powder in the proportion of fifteen parts oxide of zinc to one of vaseline, grinding up together carefully. It absolutely prevents the irritation, and his experience teaches him that the usefulness of the filling is in no way impaired.

Dr. W. H. Marshall, Oxford, Miss.: "The Marshall Matrix," for amalgam fillings.

Dr. C. C. Carroll inserted an aluminum amalgam filling, demonstrating the use of the Carroll-Campbell Engine and Handpiece.

Dr. T. W. Brophy demonstrated the use of the "Doriot Surgical Engine" in an operation for the removal of a tumor.

Dr. L. C. Bryan, of Basle, Switzerland, demonstrated the use of his forceps for the immediate correction of irregularities. The tooth operated upon was a right superior lateral. The operation consists in cutting the process around the tooth to be moved, then placing a stout piece of metal the shape of the exterior of the arch around the teeth, and with the forceps moving the tooth up to the line, and ligating it in its correct position, local anæsthesia being produced by the injection of cocaine.

Dr. W. G. A. Bonwill demonstrated the use of his improved mechanical mallet. He also gave a demonstration, in his own mouth, of his method of clasping teeth on all gold plates, from one to full upper set, where one tooth only remains.

He explained his principle of practice in the use of pink gutta-percha base plate for filling all cavities, and obtaining greater width of separation between the bicuspids and all the molars. He showed its use as a matrix in filling with gold or amalgam, also the use of paraffin in being melted over and into all oxyphosphate fillings to make them harder and last longer; and also melted it over all-gold fillings to hermetically seal any vacancy that might be between bone and filling.

Dr. Thos. Fillebrown demonstrated the method of sustaining ether-anæsthesia by the use of blow-pipe and foot-bellows. The claim is made that anæsthesia may be thus kept up for a long time without unpleasant or injurious effect upon the patient.

He also gave a demonstration of his methods in hypnotic suggestion in the painless extraction of teeth.

Dr. J. J. Stedman, Laporte, Ind., demonstrated his method of retaining full dentures by means of the "Stedman Springs."

Dr. Schreier exhibited and explained his method of treating putrescent pulps with Natrium Kalium.

Dr. C. C. Carroll demonstrated practically his cast aluminum work.

Dr. O. B. Love, San Antonio, Texas, showed the use of mouth illuminator.

Dr. Louis Jack, Philadelphia, demonstrated the use of the "Jack Matrices and Matrix Pluggers."

Dr. W. H. Richards demonstrated his method of filling tortuous root-canals at the apical foramen with metallic fiber.

Dr. Geo. W. Weld, New York, demonstrated the non-irritant action of his Syrup of the Chloride of Iron.

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DIANA CLIFFORD KIMBER will soon publish a text book on "Anatomy and Physiology for Nurses," in connection with Louise Darche. Miss Kimber's experience as assistant superintendent in both the New York City and the Illinois Training School for Nurses has led her to feel the need of such a manual and to undertake the work. It is designed to fill a middle place between the text-book written for medical students and that for use of children in schools. The subject is presented in a scientific manner, but the technicalities which discourage the average student have been, so far as possible, avoided.

# COMMUNICATIONS.

## Sulphuric Acid for Opening Root-Canals.

BY J. R. CALLAHAN, D.D.S., CINCINNATI, O.

Read before the Ohio State Dental Society, December, 1893.

The opening of "Root Canals" has been the subject of much discussion and many wild assertions. We have often heard of dentists who claim to be able to open to the apex, the root canal or canals in any tooth.

I wish to say that no such claim will be made for the method that I desire to bring before you to-day. For the opening or enlarging of all straight and unobstructed canals, I prefer and use the "Gates Glidden Drill," after the manner described by Dr. Geo. Evans, in his work on "Artificial Crown and Bridge-Work," Third Edition, (page 21), but, valuable as this instrument may be, we see almost every day in practice, canals that cannot be opened properly by this or any other drill. It is seldom that we see canals in buccal roots of superior molars, or in roots of lower molars, in which a drill can be used; many times in bicuspids and inferior incisors the roots are so flat and thin that drilling is dangerous; yet all these canals may be in such condition that we are compelled to open them for treatment and filling. There are canals that are constricted just at the chamber, sometimes so much so that they can scarcely be found, yet the canal in the root is large and should be opened. There are the canals in curved roots, and canals obstructed by osseous growths, that if not properly opened would most likely cause trouble. It is with this difficult class of root-canals that I wish to deal at this time.

It has been about four years since I began to open this difficult class of canals by using a 20 to 50 per cent. aqueous solution of sulphuric acid and the Donaldson Root-Canal Cleanser. To illustrate the method, let us suppose we have a superior molar tooth, from which the pulp tissue has been removed, the palatine root being large, can be prepared by any method you may choose; but let us say, the canals in the buccal roots cannot be found, we would then place a pledget of cotton, saturated with the acid solution in that portion of the cavity near the buccal roots and seal it in the tooth for twenty-four or forty-eight hours; then upon removal of the stopping, wash out the cavity with a dash of water from the syringe, upon drying the cavity you will find it white and clean, with two dark spots in the vicinity of the buccal roots, showing where the canals can be found.

Now we try to enter the canal with the nerve bristle, we find no opening; to make sure we are not being deceived by a constriction, we take a bud drill and follow these stains a short distance. If we find no opening or a very minute opening too small for the bristle, we will feel justified in saying they need no further treatment. But, if with an exploring instrument a canal is found, we will carry the acid to the canal by dipping the instrument in the solution, or by means of the pliers, or better still with the latest pattern of the Dunn Syringe place a drop of the agent in the chamber, (the Dunn Syringe referred to is made of glass and rubber with a platinum or gold point), and with a No. 5 Donaldson Canal Cleanser pump the acid into the canal; the acid will soften the walls of the canal sufficient to allow the broach to open its way into the root; the acid will also thoroughly sterilize the canal and everything in it. No germ or spore can live in the presence of $H_2SO_4$ in the strength mentioned. The broach may scarcely enter the canal at first, but if you are persistent it will be but a few minutes till the instrument will go quite a distance into the canal until you reach the end of the root, where a much stronger resistance will be met with. The thickened cementum at this point; seeming to offer a greater resistance to the agents used. The canal can then be enlarged by using larger broaches, or if the root-canal is straight the Gates Glidden Drill will follow the canal just made. It is more than likely that the apical foramen has not yet been opened; this can be accomplished, if desired, by drilling or by placing a small thread of cotton saturated with the acid solution in the end of the root and leaving it there over night, then using the broach and acid at the next sitting; after one or two trials you can readily see how crooked or obstructed canals may be opened in a few minutes, and the canal will be in condition for immediate root filling. It must be borne in mind that the rubber dam should always be in place before the operation is begun; the adjoining teeth may be protected by placing the dam only on the tooth being operated on.

I confess that at first sight, the application of so strong a solution as 50 per cent. looks to be rather heroic; (good results may be obtained by the use of weaker solutions, but my desire to present a ten-minute paper prohibits the mentioning of many details), but four years constant use has proven to me that there is little or no danger of injuring the tooth or the surrounding tissue, if the operation be controlled by any sort of common sense. We do not hesitate to use arsenic, or nux vomica, aconite, argenti nitras, cocaine, and scores of other poisonous drugs. We can have the action of the acid under perfect control. I always keep a saturated solution of bicarbonate of soda on the case so that I may stop the action of the acid at any moment. In but few cases is it probable that the acid will go through the apical foramen in quantities or strength sufficient to have any corrosive effect, for the reason that neutralizing agents in the dentine will have materially weakened the acid before it can pass through the extremely small opening at the apex of the root; if there be an abscess present the foramen is likely to be larger and the condition of the tissues about the apex of the root will be materially benefited by the presence of the acid even if in the full strength of the solution. In my mind there could be no better agent for the breaking down of the diseased tissues and the positive destruction of all germ life.

A case in practice will probably illustrate the point I wish to develop: A lady about twenty-five or thirty years of age who had been under surgical treatment for a large fistula at the symphysis of the chin, came to me at the request of the surgeon for examination and treatment, if I thought the case demanded it;

by the aid of the electric light I was enabled to locate the trouble in the two inferior central incisors; the pulp-chambers in both teeth were opened, the canal in each tooth was so small that they were practically closed; a drop of the acid solution was placed in the pulp-chamber, and with a No. 5 Donaldson Root-Canal Cleanser was pumped into the canal, in a few minutes the instrument found its way through the root, the canals were then enlarged by using larger broaches, thereby establishing direct communication from the pulp-chamber through the seat of the abscess and through the roots into the fistula, and the acid made its escape through the opening at the symphysis. On the second day the case was given the usual antiseptic dressing; on the fourth day the roots and fistula were thoroughly filled with chlora-percha. The case was kept under observation for a few days, no signs of inflammation appearing the case was dismissed as cured. This is one of a number of cases successfully treated in this manner. In this case I do not believe the roots could have been opened in a reasonable time by any other method, and I also believe that the acid solution was the best remedial agent that could have been applied at that stage of the treatment. The acid at first attacks the tooth substance vigorously, breaking up the lime salts, and corroding or changing the form of the organic substance and forming a new compound, thereby establishing a barrier to the further progress of the acid.

Prof. J. S. Cassidy, in his valuable text-book, "Dental Chemistry and Materia Medica" (page 77), says: "The acid attacks the earthy portion forming insoluble calcium sulphate, ($CaSO_4$), and at the same time dehydrating the animal or gelatinous portion, which is mainly made up of carbon, hydrogen and oxygen; these two latter elements are withdrawn as already alluded to, leaving the indestructible carbon as a residue, to be incorporated with the insoluble sulphate, producing thus, a protecting covering to the unaffected parts beneath, against further inroads both of the causing agent and other solvents."

I have here several specimens which I hope you will examine carefully. Large cavities were cut in sound teeth; the cavity in No. 1 was kept full of a 50 per cent. (by volume), solution of sulphuric acid for ten minutes. The cavity in No. 2 was kept full of same solution for two hours. The cavity in No. 3 was kept full of same solution for twenty-four hours. The cavity in No. 4 was subjected to no other treatment than to be washed with alcohol. The cavity in No. 5 was filled with same solution on December 1, at 1 P. M., and kept full till the morning of December 5, when I placed a pledget of cotton saturated with the solution in the cavity, and sealed it in the tooth with wax. This was done that I might bring the tooth to you, that you may open and examine for yourselves. In No. 5 the root canals were opened as described, by the use of the acid and broaches, and the ends of the roots were then ground off to show the action of the acid on the walls of the root-canals near the apex. No. 6 received no treatment further than to have the ends of the roots ground off the same as No. 5, in order to show the normal appearance of the root-canal near the apex. I think you will be unable to discover any material difference in the appearance of the dentine in Nos. 1, 2 and 3, which I think is proof that the action of sulphuric acid on tooth substance is self-limited, for we find in this experiment that the acid penetrated the tooth substance, practically, no farther in twenty-four hours than it did in ten minutes. If with an excavator the almost invisible layer of dissolved dentine be removed, a perfectly hard, smooth surface will be found. About the root-canals, specimen No. 5, you will see what appears to be a small zone of decalcified dentine. A glance at No. 6 will show the same appearance. As to the action of the acid solution on the bone surrounding the roots of the teeth, I quote Mr. George Pollock, F.R.C.S., Surgeon to St. George's Hospital, who says: "Dilute sulphuric acid does not affect the living bone, acting chemically on diseased bone alone," and gives the following experiments: "Portions of dead diseased, and healthy bone were selected and subjected to the action of sulphuric acid, viz.:

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|---|---|---|
| No. 1. | Dead bone, | 10 grains. |
| " 2. | Diseased bone, | " " |
| " 3. | Healthy bone (middle age), | " " |
| " 4. | Healthy bone (old age), | " " |

"Exposed to the action of a mixture of sulphuric acid and water, one part in four, for three days, at a temperature of 100 degrees, the following were the results:

"No. 1. Dead bone: Phosphate of lime 2 grs. Carbonate of lime 3.30 grs. dissolved in the mixture.

"No. 2. Diseased bone: Phosphate of lime 2 grs. Carbonate of lime 1.3 grs. dissolved in the mixture.

"Nos. 3 and 4. In both specimens of healthy bone. *No action took place.*"

Prof. Garretson says, in the treatment of "Caries of the Maxillæ," he has used the "officinal ordinary sulphuric acid." (Garretson's Oral Surgery, Third Edition, pages 705 and 706.)

On the soft tissues the solution will have a corrosive and astringent effect, or in other words will break down or destroy the diseased tissue, leaving a fresh, clear field for nature to take care of herself, with the assistance of milder antiseptic treatment.

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## The Relation of Dental Caries to Certain Forms of Indigestion.

BY E. F. WILSON, M.D., COLUMBUS.

Read before the Ohio State Dental Society, December, 1893.

To the general practitioner of medicine no subject is of more importance than that of the various disorders classed under the head of Indigestion or Dyspepsia. That they have always been the "bete noire" of the profession is shown by the infinite number of remedies that have been, from time to time, heralded as cures. The patients of this class are the ones who wander from one physician to another with their tale of woe, and tell each one in turn how they have been treated or mistreated by his predecessor.

Volumes have been written on the subject, and it has been the aim of hundreds of investigators to find what the causes are that underlie these troubles. There are, no doubt, a variety of causes, and in this, as in every thing else, each cause produces its own effect.

I wish to-day to call your attention, for a short time, to one cause that seems to me of great importance in producing certain classes of these disorders. It is also a cause that is very often overlooked or neglected. That the condition of the teeth should have a great deal to do with the subject of indigestion is apparent to all. Every physician has seen the old man or old woman, without any teeth, or only a few "snags," complaining all the time of trouble with the digestive apparatus. They say their stomachs hurt them and that they have to "rift" wind for several hours after eating. They are uncomfortable and unhappy. They would answer "no," if asked the question, "Is life worth living?" But see that same old man or woman after one of our friends, the dentists, had supplied him or her with a set of new teeth. They are entirely different persons, cheerful and happy so far as a fairly good digestion can make one.

But this trouble with the teeth is not confined to the old and toothless. It begins with the infant. Nature recognizes the fact that the stomach is not able, by itself, to digest any but the most easily assimilated food, so she furnishes the young child milk, and a milk that does not form a hard curd, but is more of a flocculent mass and very easily taken up and digested. As the teeth begin to come the salivary glands also begin to develop and prepare their secretion to assist in the digestion of mixed foods that the child is now ready for. In a large per cent. of children the teeth are not perfect and decay begins soon after they are erupted. Whenever this happens, almost without exception, the child will develop some one of the various symptoms that accompany digestive troubles in children. Until very recently the general practitioner of medicine has not attached much importance to the decay and loss of the deciduous teeth, and almost nothing has been done to encourage their preservation until such time as the permanent set is erupted.

The teeth stand at the entrance or gate of the body, and their chief duties are the mechanical part of digestion. If the teeth are imperfect or decayed the mastication of the food is imperfect. Instead of going to the stomach in fit condition to be acted on by the digestive ferments, it is more nearly in the condition of the food of birds, that have no teeth, but are supplied with a gizzard. Unfortunately in our make-up the gizzard was omitted, and the result is that if the teeth are not in condition to do this work properly and well, we suffer the pangs of indigestion, with all the sympathetic disorders that follow in its train.

It is true that the evil effects of " bad teeth " are seen more frequently in childhood and in old age than at any other time of life. I am satisfied that in children a number of diseases may be traced to the carious condition of the teeth. Suppuration of the middle ear is caused again and again by a carious tooth. Disease of the eye is also caused by the condition of the teeth. Various neuralgias and reflex nervous symptoms arise from the same cause. Last, but by no means least of all, come the digestive troubles brought on by the carious teeth.

Have these things been regarded sufficiently in the past? How many of you, until within the past few years, have been called upon to treat and preserve the " milk teeth ? " Was it not, rather, is it not the fashion to let them go, as they will not pay for being treated, they will be replaced so soon by the permanent teeth ? This false economy has been responsible for a countless number of sickly, ill-nurtured children, who if they live to reach puberty make the nervous, dyspeptic men and women that are met in every walk of life, and that are pointed out by our English cousins when they say " Americans are a race of dyspeptics."

The art and science of dentistry has reached such a high plane that any neglect of the children's teeth in the future will be little less than criminal. It is also to be hoped that the time has come when the physician will realize his obligation in this matter and will have the children's teeth carefully examined and treated at least once in six months. In regard to older patients it is hardly necessary to say anything. It is recognized, both by the patient and physician as necessary for æsthetic as well as for hygienic reasons, that the teeth should be kept in repair. There are though a large per cent. of people, who on account of their finances, or for some other reason, neglect the teeth and shun the dentist. It is among this class that we find the digestive trouble caused by faulty mastication and fermentation.

The troubles caused by faulty mastication are entirely mechanical and have already been referred to. Those of fermentation are still to be explained. Let us call your attention for a moment to the pathology of caries. Prof. Miller, of Berlin, says: "It has long been known that the human mouth was the abode of numerous microscopic organisms; but only within the last five or ten years, since more exact methods of bacteriological investigation have come into use, we have been able to acquire much definite knowledge as to the morphology, physiology, etc., of these minute organisms. Recently the study of the bacteria of the human mouth has been zealously pursued by various investigators, and much has been accomplished toward bringing to light the causes of various affections of the mouth and associate parts.

"There is no part of the human organism which furnishes a more universal culture medium for bacteria than the oral cavity, and the different varieties of micro-organisms that find in it conditions favorable to their development are correspondingly numerous. Of these the larger part are of a non-pathogenic character, existing upon the various organic substances in the oral secretions, and upon particles of food which have been allowed to remain between the teeth, but producing no particular deleterious effects upon the surrounding parts other than the decay of the teeth." Miller divides the oral bacteria into several classes, one of which is composed of a large number of bacteria that decomposes sugar, forming lactic acid. It has been proved in the past few years, that decay is caused by a decalcification of the tooth substance, followed by a solution of the decalcified basis substance. The decalcification is brought about by acids, chiefly lactic acid; and these acids are produced by the action of micro-organisms on carbohydrates. The solution of the decalcified tooth substance is accomplished by the peptonizing power of the same or other micro-organisms. So much for the pathology of caries.

What bearing has all this on our subject? Can these micro-organisms be carried to other parts of the body and there do harm? James Israel describes a number of cases of abscess on the neck, chronic pyæmia, etc., which owed their origin to these organisms. That they are also able to produce both chronic and acute disturbances of digestion there can be no doubt. By the continual swallowing of the bacteria lodged in the mouth we have one of the most frequent causes of fermentation dyspepsia. It is now known that most of the bacteria found in the mouth may pass through the stomach without losing their vitality, and under certain circumstances may produce severe disturbances in the intestinal tract. So, now that the pathology of dental caries is better understood, the connection between the proper care of the teeth and some of the phenomena of indigestion are easily traced.

To us, as practitioners of medicine and dentistry and as practical men, all these things show only this: what an important field we have in the human mouth for investigation and study; and how much the general health depends on the proper care of the teeth.

## The "Devitalization of Pulps."—A Confession.

BY C. M. WRIGHT, D. D. S., CINCINNATI.

Read before the Ohio State Dental Society, December, 1893.

Having been actively engaged in the practice of dentistry for thirty years, I want to confess that during all this time, I have had trouble and annoyance with the little organs of nutrition which nature, in some freak, developed in the central portions of the teeth. The organs which we classify anatomically, as *pulps* of teeth. Histology has taught us what tissues go to make up these bodies. Physiology tries to satisfy us that their function is a useful one. Embryology has interested us in discussions about their development. Pathology proves to us they are liable to various structural and functional disorders. And Etiology has pointed quite plainly to the causes of the variations from a normal or physiological condition; but with all the knowledge thus offered by these important "ologies"—therapeutics seems sadly at fault, and offers meager means of cure and seemingly unscientific methods. Therapeutics, when applied to disordered pulps, is weak and not progressive.

Thirty years ago we applied arsenious acid, ground up with creasote, sulphate of morphia, charcoal, oil of cloves, etc., etc., in quantities of about one-fiftieth of a grain to "exposed pulps"—and covered the same with cotton and sandarac or gutta-percha Thirty years ago the patient left the office of the dentist with the assurance that "possibly there may be a little pain for a while, but the nerve will be killed," and in a quarter of an hour the little pain began, and for hours it increased in size, while the patient raved and swore and knocked himself about, till he returned to the same dentist, or to another more accessible, with blood-shot eyes, and agonizing throbs over the entire side of the face and head, to beg for the immediate extraction of the tooth. The dentist did not comply then any easier than he does to-day, but with soothing words and expressions of astonishment at the unusual conduct of this particular case under the application, and fair promises of relief, he removed the plug and the arsenical preparation, washed out the cavity with warm water, pricked the congested pulp until hemorrhage ensued, applied some opium or creasote, or clove oil, until the pain became less and dismissed the patient for a day or two.

The same mild fiction with the same tragical environment is constantly repeated to-day. In the meantime many "sure cure" methods recommended by speakers in dental societies, writers for dental journals, and friends in consultation have been faithfully tried.

1. Cobalt has been substituted for arsenious acid.

2. Pressure of the medicament as a cause of pain instead of the arsenious acid or cobalt has been deeply considered, and saucer-shaped tin disks with the medicine in a comparatively fluid condition have been cautiously placed over the exposed pulps and the cavity filled with gutta-percha, oxysulphate or oxyphosphate mixed with an essential oil.

3. The Clowes "safety pockets" have been faithfully tried, and arsenic applied to the dentine and covered up, safe from pressure, and from other possible accidents.

4. Physic has been thrown to the dogs and surgery called in, and the "knocking out" plan, with a sharpened stick, wet with carbolic acid, driven into the straight-rooted teeth, or anæsthetics, notably nitrous oxide, have been administered, and sharp burs revolved by the dental engine have been thrust into the pulp chambers.

The Charles Kingsley method of delicately introducing a watchmaker's broach into the canal to the apex along the side of the pulp and rapid twisting of the broach as a final act has been tried once or twice.

A return to drug methods followed, and nitrate of silver, nitric acid, creasote, oxide of zinc saturated with creasote, as a capping and slow devitalizer, have all been tried.

After thirty years of constant practice I have to confess with shame, that I still have trouble, and by far too large a proportion of failures in this common operation of devitalizing these little organs, so that I may remove them perfectly and painlessly from the teeth and put gutta-percha or some other material in their places.

The necessity for removing these bodies is almost a daily one. In my practice, it is an important and exceedingly common operation in dental surgery. It is performed hundreds of times each year, and yet the proportion of failures to perform it speedily, easily, scientifically, and painlessly is appalling. My idea of a successful operation is that when it is desirable to devitalize and extirpate a pulp we should be able to apply a drug which instead of acting as a violent irritant and causing hyperæmia and intense pain, should benumb permanently the nerve fibrils at once, and cause either atrophic changes in the connective and other tissues of the pulp, or rapid degenerations, so that the entire organ can be lifted out or washed out, after a reasonable time has passed, let us say within a week or a month. Arsenious acid does accomplish devitalization, and degenerative changes follow; but its action is so uncertain as regards time and completeness throughout the organ, and so much pain accompanies it that I feel that something else should be by this time evolved from the inner consciousness of dental therapeutic or materia medica experts. In my hands cobalt behaved so much like arsenious acid that I could not detect any clinical difference. The surgical methods seemed applicable in only a limited number of cases and even where I have resorted to nitrous oxide and the bur, difficulties have arisen in the devitalization of the pulp stumps. In the devitalization of perfectly healthy pulps, which have never been irritated to a hyperæmia beyond the normal, the slow methods of capping with creasote and oxide of zinc, sulphate of zinc, etc., are indicated in certain cases; not, of course, in those cases where we wish to devitalize and extirpate speedily for the special operation of afterwards filling the root canals.

These cases arise in my practice a few times each year, where, after fractures of the crown, malformation of the enamel, etc., crowns of some sort are indicated.

Dr. Frank Abbott is reported as saying, "The only one condition where I think of using any material for devitalizing the pulps of teeth, is where it is impossible to stop pain," and he adds, "I have for the last fifteen years used arsenic in teeth as many as three and four times and no more." Under my hand, where a pulp is fully exposed and where odontalgia ensues on account of exposure, partial or complete, pain can be quieted for a limited period, but in a majority of cases returns at the most inconvenient of times, and these teeth that I have nursed and cared for so tenderly, too frequently present themselves to me in the future, after more thorough operations by some dentist in a neighboring city, or in a summer or winter resort. That is, my operations were temporary and upon a recurrence of pain some other dentist has removed the then devitalized pulp and filled the roots and crowns in a superior manner, leaving me simply the *blush.*

Drs. Witzel, Baume, Herbst, Bodecker and Miller look for succor in the direction of preserving certain portions of the stumps of pulps in the roots of teeth after what might be called a partial devitalization of the coronal portion of the organ. This is, it seems to me, a compromise between the Abbott school and the removal of the last vestige school, and success may lie between these two schools. Certainly the patient experiments of Dr. Miller in this direction are worthy of our highest interest. A curious phenomenon presents itself in the lives and deaths of these pulps of teeth. If, in crossing a heath instead of pitching my foot against a stone or a watch, as the great Paley might have said, I should experience through the cilliated and other epithelia of the regio olfactory in my nasal passages a stimulation or irritation from the emanations of a defunct rodent, would the pschycological inquiry arise, "Does the rat still feel and hear and see and know, even if putrefactive changes appeal loudly to my senses? Yet as dentists, have we not daily evidence that putrefactive changes may be far advanced in a dentinal pulp, and that acute irritability of nervous tissue remains at the same time? The lymphatic, the connective, and other tissues may be reduced to an almost liquid state of decomposition, and yet these nerves which are believed to be trophic in function and can hardly be purely vaso-motor, seem to maintain a watchful care over the corpse of the pulp, and they awaken the guard in the centres of sensation by loud calls for assistance, whenever the dentist, acting as a ghoul or undertaker, attempts to remove the decomposing corpse from the house (or canal) where it formerly lived. This is an indisputable fact, and this is why I beg of materia medica to offer a medicine, the first quality of which shall be to benumb nervous tissue itself.

## "Vis Medicatrix Naturæ."

BY W. H. WHITSLAR, M.D., D.D.S., CLEVELAND, O.

Read before the Ohio State Dental Society, December, 1893.

The diseases that the human body is subject to, number into the thousands. The teeth, as important organs of the human economy have diseases peculiar to themselves, also those that are symptomatically observed in remote parts of the body.

Upon first consideration it would appear that there are many diseases of the teeth, but scarcely fifty idiopathic ones can be numbered. This seems, however, to be a great many. Literally, only the organized portions of the teeth may become diseased. The mineral constituents while predominant in quantity are subservient to the organized material interposed. Vital phenomena aid in resisting disease, but external influences may, as in caries, cause disintegration of mineral substances, leaving only the life portions with insufficient material to make a healthy stump.

It is here that the dental surgeon with his sharp excavators and chisels removes the disease.

If perchance there remains enough body to aid retention of foreign materials, like the surgeon who supplies a missing portion of the skull with metallic substances, the dental surgeon inserts fillings for the arrest of decay and restoration of form, the restoration of tooth substance being impossible.

The practice of dentistry is a surgical procedure in the main, since it consists of the manual operations adapted to cure of diseases.

A surgeon aptates tissue, Nature performs the cure.

The dentist cannot aptate the hard tissue because of the quantity being too great to be carried into the circulation or otherwise substantially affected by it. He supplies their loss and the presence of foreign materials is either tolerated or rebuked by the remaining living parts.

Pain is the first rebuke, and efforts to repair are the first fruits of Nature to resist invasion.

The resiliency of Nature is peculiarly strong in the absorption of deciduous teeth, not abstractedly, but for the provision of teeth for mastication in ultimately strong men and women.

We have here growth, growth which is the antitype of repair, and repair which is the repetition of growth. The same elements are necessary to the formation of results in either.

*Rest* is the necessary antecedent to both growth and repair. This principle is noticeable in the vegetable kingdom. "All plants require rest and obtain it in some countries by the rigor of winter, in others by the scorching heat of summer." Said John Hunter, "Some plants close their leaves, others their flowers at particular hours of the day or night, and with such regularity does this period of rest take place that more than one vegetable physiologist has proposed to construct from them, a floral clock."

Repair in the young body is accentuated by conditions of the body and its requirements. It is often necessary in providing remedies for growth and repair, to have a knowledge of the temperament, age, physical condition, occupation and general surrounding circumstances of the individual, as a basis upon which to advise remedial application.

The healing power of Nature has a constant tendency to repair injuries and this is accomplished by interposing material to prevent invasion of further injury or disease.

It is clinically observed that, under certain classes of fillings a hardening of tissue results. This cannot be due to the hardening of each molecule of the mineral substance composing the tooth, but that remoleculization probably is due to vital fluids which may act as the water of crystallization.

In the pulp and tissues about the teeth, Nature provides a coagulable lymph to form a splint, for the purpose of coaptation of divided tissues in order to secure a degree of rest. This inflammatory effusion is not the ultimate bond of union, but holds the parts in apposition, prevents friction, provides against invasion of microbes, and allows nature to dispose of the offending cause. This is why, when we wound the gums as in the removal of tartar, the result of injury to the gums is so frequently *nil.*

The fibrous nature of the gum aids in holding the lypmh, interlocking it in its meshes, thus providing a safeguard against the ravaging microbes of disease, or the toxic properties of the saliva.

There is an inherent power in every cell to recovery, so that, as time elapses, the cells under this seruminal matrix become old enough to withstand outward influences, a solvent then separates the dried matrix and it is cast off. This is precisely what we seek to accomplish in our treatment, i. e., to remove cause of disease and protect the tissues.

It is surprising what Nature will do for us.

Too often the praise is ascribed to the skill of the dentist, though skill is necessary to combat the evils of too much medicament, thus limiting Nature's right to perform its natural functions.

The dental pulp is so sensitive an organ that it is our belief that more pulps die from over medication than from other causes. Rapidity of introduction of various medicaments alternate shocks that at once exhaust the vital energy of the cells also causing congestion of the vessels. It is further our belief that following the death of the pulp, the pulp-canal is made a reservoir of all kinds of fluids supposedly for medication but inviting necrosis of the tissues of the apical space. Abscesses encroach upon the other tissues and destroy them, followed by pain and constitutional disturbances. We open abscesses to relieve these conditions, and evacuate fluid to cause coaptation of the organ zed tissue. Nature will cement them together. Our efforts to cure abscesses are sometimes failures because putrescible substances do not permit coaptation of desirable tissues. In some of these instances our medication though scientifically (?) applied results in dire failure. The object of this paper is not to decry the use of medicines but to express the sentiment that it is a laudable and a progressive profession that is seeking the best remedies for disease.

It is, however, patent that while we favor the correct application of medicaments liberally, let us be conscious of the healing powers of Nature.

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THE suicide mania has became so great in Denmark, that the government is considering measures to check it. One likely to be adopted is the Swedish law, which compels the body of every person who commits suicide to be sent to the dissecting room of the nearest university.

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THE Turkish Government prohibits the importation and sale of secret patent medicines within its dominions.

## A New Practical Method of Fusing Platinum.

BY L. E. CUSTER, B.S., D.D.S , DAYTON, O.

Read before the Ohio State Dental Society, December, 1893.

The process I am about to describe is one in which electricity is the active agent, so for a clear understanding, technical terms will be avoided as much as possible. Although the perfected process is quite simple, it is the result of considerable study and experimentation.

The production of heat by electricity depends upon two factors, the quantity of electricity and the resistance of the conducting agent. As the quantity is increased the heating power is increased, but this power is not apparent until the current meets with some resistance. The unobstructed flow of any quantity of the fluid does not produce heat. It is only when there is placed in the circuit a poor conductor of electricity that we have this manifestation.

All metals are comparatively good conductors of electricity, yet these vary in their conducting power. Copper stands at one extreme and German silver at the other. In the electric gold annealer, platinum wire is used because it is a poor conductor and does not oxidize. (Experiment with copper and German silver wire.)

The size of the wire is another factor in the determination of heat. With a given length of wire the resistance increases as the diameter of the wire decreases. That is, a small wire has less carrying capacity than a large one, so that when the same amount of current that is easily conducted by the large one, is forced through a small wire, the condensation, I will term it, produces heat. (Experiment with large and small wire.) So with the same quantity of electricity at a given pressure, heat is produced according to the resistance of the conducting agent.

The atmosphere is practically a non-conductor of electricity, yet under certain circumstances it does allow the passage of an electric current. When a current has been established by bringing two terminals together, the electricity continues to flow, even after the ends have been separated. It leaps the intervening thickness of air in the form of the voltaic arc and continues until this distance becomes too great. (Experiment with carbons). This action develops so much heat that it has led to the supposition that electricity is another form of heat. When the oppositely electrical clouds unite, it passes through the atmosphere as lightning, when the leyden jar discharges, it is the spark, or when it lights the street corner, it is the arc. The heat of the arc is so intense that by our present knowledge it cannot be measured. By the ordinary incandescent current I find that we can not only melt platinum and iridium but in small quantities we can vaporize them.

Upon the foregoing I have devised a practical method for making and using the voltaic arc for melting metals of a high fusing point. While it is equally applicable to the "arc current" so called, and 500 and 220 volt currents, I will describe the appliance as adapted to the 110 volt current, that which is used for incandescent lighting and which is the ideal current for dental purposes.

Since a large quantity of current is necessary, the safety plugs should be as large as No. 16 or 18, English standard gauge. A resistance coil of four pounds of No. 18 copper wire will prevent fusing the plug and at the same time give a large arc. This is placed at a convenient point in the circuit. It becomes heated, so should be insulated and ventilated on asbestos if it is to be used any length of time.

A block of carbon, such as is used in batteries, is connected with one wire for the receptacle, and a carbon pencil is attached to the other wire. Carbon is used for the receptacle because it is a conductor of electricity, a poor conductor of heat, is noncombustible, and can easily be fashioned to mould the melted metal. An improved bed is composed of ordinary stove blacking and powdered asbestos, equal parts, and thoroughly mixed and united. This is a poor conductor of electricity and is itself heated by the current. It is also a better non-conductor of heat, which is of importance where large quantities are to be melted. A piece of charcoal being a conductor of electricity and a poor conductor of heat, also makes an excellent receptacle. This part of the appliance should be mounted on an asbestos base, or if small quantities are to be fused, it may be held in the left hand by a suitable handle.

In the right hand the carbon pencil is to be used. This is made of an electric light carbon five or six inches long. A hole is drilled two-thirds its length, and in this hole is inserted the other terminal wire. This wire is so insulated that only the end comes in contact with the carbon. By this arrangement the upper two-thirds of the pencil, although charged electrically, does not become heated and answers for a handle. With the incandescent current there is no danger to life.

The operation is very simple. The platinum is laid on the carbon bed and the pencil is brought in contact with it. Immediately there is a current established from the pencil through the platinum to the carbon bed or *vice versa*. Upon raising the pencil a short distance an arc is formed directly upon the metal and it is melted. The arc can be carried about at will until the pieces are all brought into one mass.

With the above arrangement from five to eight dwts. may be melted at once, but there is no limit to the amount that can be gotten together in one mass by a process of fusing. It is possible to so manipulate the arc that only part of the mass will be melted and to this more metal added.

## The Teeth of Children.

BY HOWARD VAN ANTWERP, D.D.S., MT. STERLING, KY.

*Gentlemen of the Kentucky Association:*

The opinion that our professional practice should be more largely preventive than it is and the proverbial ratio between prevention and cure, suggested to me the consideration of the above subject, along the line of their structural improvement, by the employment of a more rational dietary. Observation has further convinced me of the importance of an investigation of this phase of the subject. That there is need of some radical change looking to the better development and more perfect calcification of the teeth of these young patients is evident to the most casual observer in the profession. We are almost daily appealed to in this wise: "Doctor, why are Jennie's teeth so bad, when her father's and mine are good yet?" or "my teeth were not decayed so early, why is it?" As a rule the dentist questioned, through ignorance or a desire to avoid an explanation of "the why," ascribes it, in a general way, to "modern civilization," "race degeneracy," or something else equally indefinite. True enough, but of what practical help? Nothing is done to check the evil or to prevent it in succeeding progeny. Parents are not so much to blame, because of lack of education along this line, and for the dentist appealed to, to fail to answer these anxious questions in a definite and helpful manner is, at least, reprehensible practice.

The consideration of the subject will be from a common-sense standpoint and I trust physiological. Not having enjoyed (?) the supervision of a nursery, I cannot give you the result of personal experience in the natural manufacture of good teeth, but I believe they can be made good and hard. Modern dietetics fail to meet the requirements of the case and I would respectfully urge the point that the dentist is the proper person to intelligently direct and promote this change.

In the Dental Museum of the University of Michigan is to be found a fine collection of human maxillæ, skillfully prepared and arranged in series, showing their development and the calcification and eruption of the teeth. An examination of these preparations shows that at seven and one-half months, in utero, the jaws are almost as thin as paper with the crowns of the superior and inferior temporary centrals partially formed, with the other temporary teeth indicated by small pin-head nodules. At birth the dentine crowns of these centrals is well formed, while the crowns of the temporary molars are barely outlined. Eight months after birth we see the crowns of both upper and lower incisors fully formed, with their enamel complete, beginning to erupt and about one-third of the root portion formed.

At this time the first molar is just beginning to calcify. At one year the upper incisors and lower centrals erupted, roots half formed. First molars existing as flat, hollow caps. First trace of upper first centrals. Twenty months see all but temporary second molars erupted; temporary cuspids half through, while roots of temporary incisors are complete, and crowns of second temporary molars formed. Crown surfaces of first permanent molars well developed, fissures deep and cusps well defined. Crowns of upper and lower centrals and cuspids, permanent, well along.

At two years all of the temporary set are *fully* erupted except the second molars. First permanent molars in good position and coming, with half of crown full sized.

At four and a half years temporary set is complete, second incisors being in. Crowns of permanent centrals and cuspids fully formed but not completely calcified. Bicuspids beginning to form. First molar crowns fully formed and almost completely calcified.

At six years all temporary teeth present with roots fully formed. First permanent molars fully erupted with roots half formed. Central roots complete, grading back to bicuspid crowns, which are just shaping. Second molars are seen, crown shells full shape.

At *seven years* of age the *enamel* of all the *permanent teeth* (except the third molars) is *fully formed, even* the second molar *crown* being complete, though the roots are yet forming. The upper centrals are erupted as are also the lower incisors. The bicuspid roots are forming synchronous with those of the second molars, the roots of first molars being three-quarters formed.

Ten years of age finds these first molar roots complete, with the crowns of the second molars partially or fully erupted. Upper thirds just beginning to form.

At thirteen years all except lower second bicuspids and third molars are in.

At eighteen all the teeth except these thirds, are in place, in large, well-developed jaws. The greatest development of the maxillæ seems to occur between the second and fourth years, doubling their size during that period.

A resume of this table of calcification shows that so far as the *structural* formation of the permanent teeth is concerned, the die is cast by the time the child is ten years of age. During this time the entire osseous system has also been developing rapidly, but, unlike the other osseous structures, the teeth at this age are full size, and there can be no further growth in them to make up for any existing *structural* deficiency. How very important then it is that the dietary of children should contain an abundance of the elements needed by nature to build good sound teeth, free from those well-known peculiarities of form and texture that make them an early and easy prey to the ravages of caries. These surface indications are atrophied spots and girdles, soft, white belts and pits, with deep and irregular fissures, often decaying immediately after eruption, clearly exhibiting very faulty calcification of the enamel and the dentine as well.

A little girl has recently come under my care whose teeth well illustrate this theory, as well as the perversity of dental organization in the same family. Her father is quite old and never had anything done to his teeth—which he claims is the reason they are all there. Her mother's teeth are good to-day, some few filled, but they are very hard and of firm attachment. A brother, twenty-seven years old, has all thirty-two teeth, only three of which have been filled; they are remarkably well formed and very hard. Now about her own teeth, six upper anterior teeth filled three years ago. First molars filled "way back yonder," to use her own words. Six lower anterior teeth filled recently, as were the bicuspid fissures and sundry deep pits on the faces of the cusps of cuspids and bicuspids. She is just erupting her second molars—all decayed —the lowers especially presenting cavities that will sacrifice at least half their crown surfaces. Now the question is, whether or not this condition is due to a diet deficient in mineral matter. An inquiry into the dietary of this family shows: Father and mother raised up on old-fashioned water-ground wheat flour, Kentucky cornmeal and hominy, brown sugar and plenty of milk. The son has always been very fond of milk, and has eaten a great deal of corn bread. All are tall and possess large frames. The little girl—pet of the family—has rejected the coarser and plainer fare and subsisted almost entirely on hot biscuits and coffee, with sweetmeats to vary the monotony. The condition of her teeth is not to be wondered at, considering their opportunities.

Starting from the very beginning, we quote from Dr. W. X. Sudduth, in the "*American System*": "All cells lie embedded in or are bathed by a fluid which is more or less gelatinous in consistency. It is from this surrounding medium that the cells derive the supply of nourishment necessary for the performance of their functions. Cells are capable of cellular activity in proportion to the amount of cell-pabulum this fluid contains. I do not say that cells are *active* according to the amount of food supply present, but that they are *capable* of putting on cellular activity just in proportion to the amount of cell-food at hand, and in this way are stimulated to increased functional activity. Bricks cannot be made without straw, neither can tissues present increased functional powers without plenty of food with which to nourish themselves." And it is just so—nature cannot produce good teeth unless she has the necessary materials on hand during their period of production.

Van Bibra's table gives the composition of human teeth as follows:

| | CEMENTUM. | DENTINE. | ENAMEL. |
|---|---|---|---|
| Organic | 29.27 | 28.70 | 3.59 |
| Inorganic | 70.73 | 71.30 | 96.41 |

The inorganic portion divides up as follows:

| | DENTINE. | ENAMEL. |
|---|---|---|
| Phos. Cal | 66.72 | 89.82 |
| Carbon. Cal | 3.36 | 4.37 |
| Phos. Mag | 1.08 | 1.34 |
| Salts, etc | .83 | .88 |
| Organic | 28.01 | 3.59 |
| | 100.00 | 100.00 |

The totals of the first table give 238.44 parts of inorganic as against 61.56 organic—a proportion of four of inorganic to one of organic in these portions of the tooth. The composition of the enamel, the most important part of the tooth, because most exposed and least likely to repair, shows a very great preponderance of the inorganic: 96.41 inorganic to 3.59, organic; which last some writers even question as organized organic matter.

Now, how can this enamel, almost wholly mineral, be produced in the requisite perfection of form and structure, from food stuffs that contain but little if any of the necessary material?

In recognition of the disparity of opinion in regard to this theory, I wish to quote Bart: "The food supplies to the organism may be so managed as to secure very definite results. By increasing or diminishing the whole amounts of food ingested, by variations in the quality and character of them, and by the employment of some special and restricted methods of feeding, cures are effected not attainable by medicinal (or we might as truly say, '*operative*') treatment."

And, again, Dr. Shepard, of Boston, has said: "We must either deny the truth of the testimony of the most eminent chemical and physiological investigations or grant that the question of food lies at the foundation of all improvement of the tooth structure of the coming generations."

If there be a system of waste and repair that applies to the fluids of the body, to adipose and connective tissues, to membranous and fibrous portions, to cartilage, hair and nails, the natural inference is that waste and nutrition as a principle of life and growth applies as well to the harder structures—bone, dentine and enamel. To exclude a set of organs given such an important place and office in the human economy, from physiological processes common to the other tissues, is evidently unwise. Besides, no organs of the body so quickly show loss of nutrition as the teeth, clearly indicating a close dependence on nutritive processes for the maintenance of their integrity.

Now, with the chemical formation and the early period of development in mind, and the belief that *nature* does use the material at hand, let us consider what foods are best calculated to secure the proper development and perfect calcification of the teeth.

The suggestions made are as practical as possible under the circumstances. When asked what articles of diet are proper, we should have them at our tongue's end, manner of preparation, and all. A very limited observation will satisfy any one that the prevalent ignorance on the part of cooks in kitchens, and women who superintend cooking and order meals for large families of children is something awful to contemplate, and formidable to attempt to enlighten. However, we have our part in the play, and the satisfaction of duty done is most often our only reward.

On the supposition that the family physician is one of broad intelligence, we will confine ourselves to the food of the child after it has been taken from its exclusive milk diet. Milk secreted from healthy blood meets all the requirements, and less harm is done at this time than later. But during and after this time mothers too often think that their children cannot eat any solid food, and a slop diet is the result, affording little of the exercise necessary for the proper development of the maxillæ.

Milk is good, however, and should be given to growing children as often as desired—not allowing them to drink it fast or in very large quantities.

Of the solid foods, bread, "the staff of life," is our sheet anchor in this proposed reform; not the pure white loaf, demanded by the modern æsthetic palate, but the good, old-fashioned brown bread, tough and sweet. From the standpoint of chemical fitness, Graham, or whole-wheat flour, stands pre-eminent, as possessing more of the constituent elements of dentine and enamel than any other article of daily consumption. In the production of the popular high-grade flours of to-day, the most important part to the growing child is rejected; giving it muscle and fat, but no bone to put it on or teeth wherewith to grind. Graham flour possesses physical advantages. By its bulk and coarseness it distends the intestines and stimulates peristaltic action, producing a laxative effect. Besides promoting digestion in this way, being more granular, when eaten warm or even hot, it does not ball up in pasty, impermeable masses, its flaky nature giving the digestive fluids easy penetration. It makes a bread which has a sweet, wholesome taste, and which rarely fails to charm the appetite of the youngster.

For breakfast you can have cracked wheat or Graham flakes, with cream and a little sugar; or Graham cakes, browned to the "Queen's taste;" or Graham gems, moist and sweet; or Graham biscuits, rolled thin and baked brown and crisp.

For dinner you may have, occasionally, Graham muffins, so light that they seem to melt in your mouth. Then you have on hand all the time, the staple lunch, brown bread, yeast or "salt-rising," sweetened or plain loaf, good and tough, giving the teeth and jaws plenty of exercise. In these and a dozen other palatable forms, this great bone and tooth-making staple can be presented to the children, so that they will learn to love it. It is not wise to attempt to keep children on this food all the time, but as you desire them to possess good, sound teeth, give it to them as often as possible. In the preparation of the Graham breads the flour should always be sifted, rejecting the coarse bran as more injurious than helpful.

Then, too, we have the various forms of the whole-oat grain, almost as good a tooth-former as the wheat. Plain oatmeal, rolled or crushed oats and others, with many recipes for their palatable preparation. A mixture of rolled oats and "wheat germ" (so-called) two to one, makes a fine breakfast dish. And last, of the ordinary grains, we mention corn, if you please. That which makes Kentucky Spiritus Frumenti famous the world over; that which, with our beloved bluegrass—possessing this same subtle something—makes our horses; and that which chiefly sustains the "colored population" and gives them good teeth. While not classed very high in the list of bone-producers, the writer cannot help but believe that Kentucky corn is different from that of other States. An examination of many sets of teeth in the mouths of young negroes has shown them uniformly well placed, well developed, smooth and hard. It may be due to their coarse diet or to the chemistry of the corn, their chief article of diet. Certain it is that the country darky's teeth are as far ahead of his town cousin's who has "always staid with white folks," as said cousin's are ahead of his employer's more favored (?) children.

Beans are good, as are also potatoes, except in the spring, when they greatly deteriorate. Macaroni is also to be recommended, being placed very high on the list by some writers.

In closing this paper I should like to ask for a free and unsparing expression of opinion from the older members of the profession, in regard to the possibility of bettering the structure of these teeth. While we have considered them as children's teeth, yet they are to serve for scores of years, perhaps, and should be as good as possible to start with. To this end I have tried to direct your thoughts, and I trust shall have stimulated your efforts.

# EDITORIAL.

## A New Degree.

At a recent meeting of the Regents of the University of Michigan, at the suggestion of the Faculty of the Dental Department, the degree of Doctor of Dental Science was established, to be conferred upon those who after completing the regular three years' course in a satisfactory manner and graduating, receiving the degree of Doctor of Dental Surgery, take another year's work, which will embrace advance work and original work as well on certain prescribed lines. It will be required in order to do this that the applicant shall have made well-nigh perfect work in his regular course. The course indicated for this degree in the scheme presented is work in materia medica, embracing laboratory work in organic chemistry, laboratory work in physiology, original work on these lines, and with special reference to some dental remedy; also in pathology, embracing embryology and histology, bacteriology, laboratory course and original research on dental diseases.

This course would add very greatly to the equipment of the dental practitioner; it would give him attainments and ability much in advance of the general graduates in dental surgery. These who have given attention to the ordinary practitioners of dentistry as they go out from the usual course of instruction, cannot avoid being impressed with the great want that is so frequently experienced by the beginner when he is confronted by many of the more severe and obscure cases of diseases of the teeth and mouth.

The object in establishing this course is, if possible, to increase the ability of the beginner in dental practice. That something more is required in this respect than is obtained, not only in dental but in medical colleges as well, in the ordinary course, is fully demonstrated by the establishment of Post Graduate Departments, especially in medicine in nearly all our larger cities, and there seems to be a call for such schools in dentistry. The efforts as yet, however, have been quite circumscribed, having reference only to some particular line of instruction, as for example: Prosthetic Dentistry, or the more practical departments of work.

## Bibliographical.

DISEASES AND INJURIES OF THE TEETH, INCLUDING PATHOLOGY AND TREATMENT. A manual of Practical Dentistry for Students and Practitioners. By Morton Smale, M.R.C.S., L.S.A., L.D.S., and J. F. Colyer, L.R.C.P., M.R.C.S., L.D.S., of London.

In the preparation of this work the authors, in the preface, say: "In compiling this manual while an effort has been made to enunciate succinctly and plainly the principles underlying the art of dental surgery, yet in no case have the practical bearings of the subject been overlooked, and it is hoped in its present form that not only will dental students but general practitioners in medicine be able to follow its descriptions and directions with ease and profit."

A casual glance through this work warrants the statement that it presents a very good *resume*, very concisely and briefly stated, of all the particulars and details in common use in operative dentistry, bringing in collateral subjects that are necessary to be considered as a basis for the ordinary operations. An effort is made in a few particulars to adopt a better nomenclature; for example: Mandible for inferior maxilla; temporo mandibular articulation for temporo maxillary joint; stylo mandibular ligament, mandibular artery, nerve, etc.

It is not very apparent, nor is it here claimed, that there is any great advantage in the use of these terms over those usually employed; if, however, they are found to be better they will, of course, be adopted by the profession.

The Manipulative Department is very brief in many of its descriptions, which perhaps is well for the student, but for the practitioner fuller and more detailed statements would seem to be preferable.

Without entering into particulars, we cheerfully commend the work to the profession and to students in particular. The authors have done their work well. In subsequent editions, however, undoubtedly there will be changes made in some particulars. It is a work that ought to be in the library of every dentist and if every practitioner followed its directions closely, in the aggregate, an improvement would be made in dental practice.

## The American Medical Association.

This body meets at San Francisco on June 5, 1894. This occurs during the Mid-Winter Fair. On account of this and many other attractions doubtless there will be a large attendance of medical men, and we desire especially that there shall be a large representation of dentists from this side of the Rocky Mountains, who will go and insure a large dental section. We are assured that the dentists of California are making large preparation for this occasion; they are doing all they can to make it pleasant, interesting and profitable to their brethren of the East who may be present.

An opportunity will be afforded for observation and sight-seeing that likely will never be realized again. San Francisco and other places and objects of interest will be available for sight-seers.

Railroad rates for the round trip will be very low, so that many inducements will be presented for the medical profession in all its departments to visit California at that time. We make this timely suggestion in order that the largest number may take time by the forelock, and be prepared to enjoy the journey and the occasion.

We shall again give more definite information when further details come to hand.

## Editorial Retirement.

In the *Dental Review*, Chicago, of January 16th, we learn that Dr. A. W. Harlan retires from the editorial management of the journal.

Dr. Harlan has had editorial charge of the *Review* from its beginning, and through its pages has done much for the profession, and succeeded in establishing a periodical of which he may well be proud. While it is a matter of regret to lose Dr. Harlan from the editorial fraternity, it will be a matter of gratification to not only the readers of the *Review* but to all who know Dr. C. N. Johnson that he is to assume editorial charge, having as associates Drs. T. L. Gilmer and George J. Dennis, and no doubt with these at the helm the *Review* will sustain the position to which it has already attained. We heartily welcome the new editors to the fraternity.

Dr. Harlan left for Europe about two weeks ago, for rest and recuperation. We trust he will ere long return having attained both these conditions in large measure.

## In Memory of Dr. Samuel Wardle.

Dr. Samuel Wardle died January 24th, at his home in Hartwell, a suburb of Cincinnati, aged seventy-two years. For two months the Doctor had been a great sufferer with catarrhal pneumonia.

Dr. Wardle was born January 2, 1822, at Leicestershire, England, came to America at the age of nine years, and settled with his parents in Philadelphia, where he was educated. At the age of about twenty-two he began the study of dentistry at Philadelphia, under Dr. Elisha Neall, who was at that day one of the prominent dentists of Philadelphia. Under this teacher, Dr. Wardle had superior facilities for gaining a knowledge of the art and practice of his profession. After his graduation in 1845, he established an office in that city, where he continued to practice for four years, when he removed, coming to Cincinnati. Upon his arrival here he established a Dental Depot, on Walnut Street, near Sixth. After continuing in this for a year or two and finding it less congenial to his taste, he here established an office, and entered upon the practice of his profession which he followed successfully to within two or three months of his death.

Dr. Wardle, though well equipped in all the particulars of his profession, was especially so in the prosthetic line, and hence he gave a large share of his professional attention to supplying artificial substitutes for the natural teeth and the surrounding parts. In this he had but few if any equals, as an evidence of which it is sufficient to mention the fact that many dentists throughout the West have been for many years dependent upon him for their finest specimens of artificial dentures.

In 1847 Dr. Wardle married Margaret Anna Little, of Philadelphia, who, with four children, survives him. These are Charles W. Wardle, D.D.S., of Maysville, Ky., Samuel H. Wardle, D.D.S., Harry, and Miss Lillie Wardle remain at home.

Dr. Wardle has rendered public service in a variety of ways, and always with honor to himself. He was for a time in the army during the Civil War of this Country. There his service was so well approved that he was soon promoted to the position of 1st Lieutenant of his company. He has also been for many years a member of the Odd Fellows and Masonic Fraternities, taking a very active and prominent part in the work of these orders, and was at various times promoted to high positions because of his efficient service and his deservedly high popularity. He was a member of the Methodist Church, and well did he sustain the character of a noble, christian gentleman, esteemed and beloved by all who knew him.

His family will have the sincere sympathy of all his friends, neighbors, and acquaintances.

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# COMMUNICATIONS.

## Some Suggestions as to the Relation of the Teeth to Empyema of the Maxillary Sinus.

BY M. H. FLETCHER, M.D., CINCINNATI, OHIO.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

In this paper the anatomy, pathology and treatment, as usually given on disease of the antrum of Highmore, will be largely omitted, since the disease of this cavity is a subject much written upon these points must be familiar to all who have given the subject any considerable attention. It is desired, however, to deal principally with the etiology, believing that if the cause of the disease is correctly diagnosed, the treatment is comparatively easy.

Authors and practitioners seem to be divided into two classes, viz., those who believe that diseases of the maxillary sinus are most frequently caused by dental lesions, and those who believe that they are more largely due to intra-nasal disorders. The latter view is held by Zuckerkandl, Schiffert, Chatallier, Krause and Bosworth.

Those who look more largely to the teeth as a cause of trouble are Lewis, Baratoux, Noquet, Boucheron, Garel, Gele, Beverly Robinson, Lennox Browne, Garretson and Tiffany. In "American System of Dentistry" (page 562), Tiffany says in regard to disease of the antrum: "It is not met with as an idiopathic affection; it occurs as the result of injury and as an extension from a diseased tooth. The first and second molars are the most likely to act as the inciting causes, as their fangs *project into the floor of the antrum.*

In treating of the diseases of the antrum, Lennox Browne says: "*The cause is almost invariably an alveolar abscess,* which has extended into the antrum through a natural connection with that cavity—as in the case of the first molar tooth or breaking down of the slight bony partition in some of the other upper teeth."

Bryant in his last edition says: "Suppuration of this cavity is often due, doubtless, to the extension of inflammation from the teeth."

These quotations are a fair sample of the words of most of those men who claim that antral troubles come largely from the teeth, and it would seem that they copy largely one from another. This I deem to be a defect in many of our text-books; many men copy from previous writers or write *for* experience instead of *from* experience, thus leaving us without additional knowledge.

Those writers of contrary opinion cite many pathologic conditions of the intra-nasal tissues as the more frequent cause. Among these causes are new growths, catarrhal inflammation, acute and chronic, and stenosis of the osteum maxillare.

It is not proposed to go largely into the etiology of the intranasal troubles, but give attention more especially to the claims of those who blame the teeth for these disorders. The writer's views coincide with those of Zuckerkandl, Schiffert and others who believe these antral troubles are more largely caused by intranasal disorders, and I wish herewith to present evidence for such an opinion.

This opinion has been arrived at after some years of experience, in addition to the examination of *one hundred skulls.* These skulls were examined with special reference to the relation of diseases of the teeth to the antrum. It is known that the anatomy of the antra of the superior maxillary bones and their nervous supply is such that there can be no disease by reflex action from one to the other as occurs, for instance, in sympathetic ophthalmia, consequently these cavities are dealt with as separate organs. The statistics then would show two hundred antra, instead of one hundred. These skulls were examined for five points, viz., 1, for abscessed teeth; 2, for septa; 3, for conical protrusion of the roots of the teeth into the antrum; 4, for perforation by the roots of the teeth without protrusion; 5, for perforation of the antrum from ulcerated teeth.

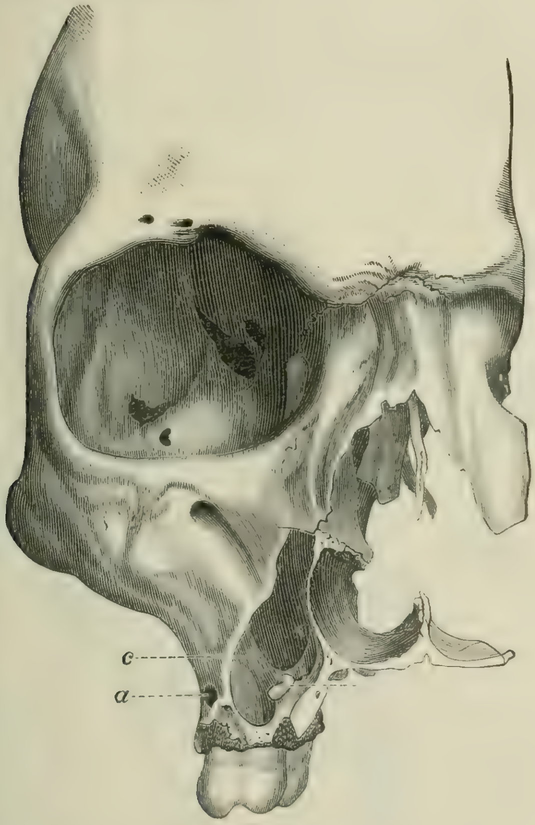

Fig. 1.

1. As to abscessed teeth and the connection of such abscesses with the antrum. Only such teeth are mentioned as might most easily produce antral trouble, viz., the three upper molars, the bicuspids and canines being too far forward to be counted in

these statistics. I might say, however, that in a number of these skulls evidence of ulceration was found in the bicuspids and canines, with no apparent connection whatever with the antra, save in one case. As to the molar teeth, ulceration was found in more than 25 per cent. of the cases; there being in these two hundred examinations, fifty-seven ulcerated teeth, and out of these *fifty-seven possible cases* of perforation by inflammation and its results, we found such to be the case *only four times;* all other cases having perforated the alveolar border and discharged the pus into the mouth, two of them discharging both in the mouth

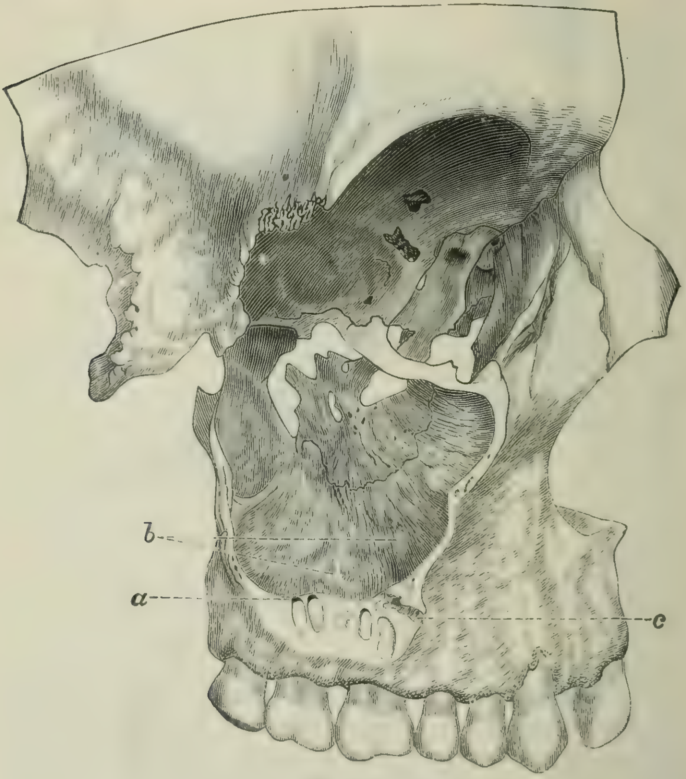

Fig. 2.

and in the antrum, as is evidenced by the specimen No. 1. (See Fig. 1-b)*

This does not show a very large proportion of cases where antral trouble has come from the teeth, being less than 8 per cent. in fifty-seven possible cases.

In addition to these figures, I wish to offer as negative evidence, statistics from my own records in regard to the relation of these diseases of the teeth to the antrum, as they have come under the writer's observation. I have in the past 10 years treated 916 cases of pulpless teeth. Two hundred and twenty-four of these being superior molars, which, according to the authors named above, could and probably would have caused inflammation or pus in the antrum of Highmore. Out of this number, from my own records, only one had pus in the antrum, as far as examination could reveal; and this is the only marked and certain case of empyema of the maxillary sinus caused by the teeth that I have seen. I have, on the other hand, treated a case in which three teeth *were made pulpless by a diseased antrum*, and this I believe to be a condition more frequently brought about than the reverse, from the fact that some of the teeth in the skulls examined perforated the floor of the antrum with no protuberance, septa, or other covering save that of the mucous membrane. (See Figures 1 and 2.)

Such perforation I have found in eight cases, which number I believe to be smaller than it should be, could all cases have been thoroughly examined for minute openings. It must be evident that the mucous membrane covering the apices of such teeth, if diseased, could easily cause the death of a tooth by destruction of its blood and nerve supply, which, in its turn, would produce a dental abscess or inflammation about the roots of the tooth, thus producing a difficult case to diagnose. The possibilities are that such diseased teeth having been found connected with the antrum, the teeth have borne the blame, instead of the diagnosis having been properly made, and the opinion has prevailed that diseased teeth are largely the *cause* of antral trouble instead of the *result*. In order that these cases can be properly diagnosed, they must needs be examined by one thoroughly familiar with alveolar abscesses, and the causes leading thereto, which I claim very few persons can do who are not experienced dental practitioners of acute and accurate observation.

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*NOTE.—It is so difficult to reproduce these sections by cuts, that the specimens themselves must be seen, in order to thoroughly comprehend many of the points referred to in the paper.

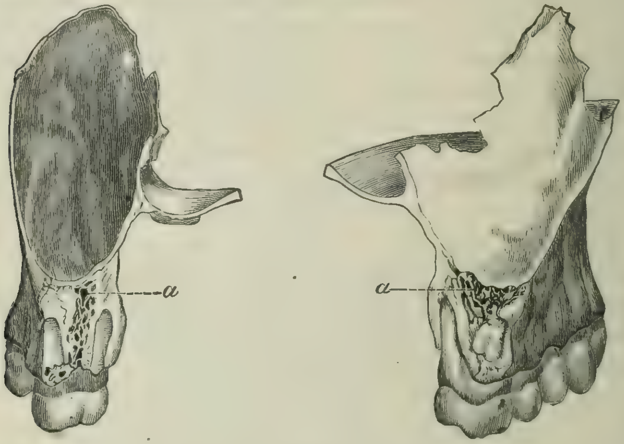

Fig. 3.

It would seem that these teeth whose roots perforate the antrum, where there is neither septa nor protuberance over the roots of the teeth, are more likely to cause the trouble in question than those which show the tubercle above the roots. This protuberance in question (pictured by Zuckerkandl, and copied by Bosworth, photographs of which cut I show you), (See Fig. 4) seems to be the prevailing idea of the relation of the teeth to the floor of the antrum, but which from my own observation is quite erroneous, never having seen but one case which approaches this condition. (See Fig. 1-a.) You can readily see these tubercles are not in the center of the floor, nor in direct line, nor is the floor flat for their reception, as Zuckerkandl's picture shows it (See Fig. 4), consequently his illustration seems ideal rather than true to nature. It would seem the rational thing (if we are to treat diseases successfully) to first know the anatomy of the parts, then we have the true foundation upon which to build our idea of the pathology. These two points being founded on truth, our treatment is comparatively easy; whereas, if we proceed on an improper conception of the anatomy, we are endeavoring to treat imaginary things, and it is only through nature's kindness that our patients recover, for nature follows unchangeable laws.

Some further observations made in regard to the floor of the antrum are as follows: in about 25 per cent. of the cases examined, small septa or ridges were found to cross the antrum (See Fig. 2). These ridges, you will observe, have no relation to the position of the roots of the teeth, although in some cases they were found to come directly over the roots in place of the tubercle, as pictured by Zuckerkandl.

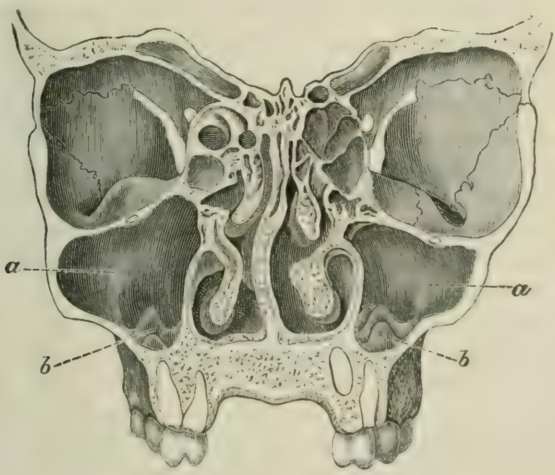

Fig. 4.

Another evidence can be presented to show that abscessed teeth do not frequently break into the antrum, by taking into consideration the amount of cancellous tissues found about and above the roots of the molar teeth in almost every case, and the very thin or entire absence of bone over the buccal surfaces of the roots. By examination of this section (See Fig. 3-a), it will be observed that the diploe or cancellous bone about the roots of most of the teeth affords quite ample space for the products of inflamthereby the teeth may be affected by inflammation of the antrum, causing their death and loss, or there may be a continuance of the trouble in the antrum by their presence, in consequence of this special feature of the anatomy.

5. That pulpless and inflamed teeth are thought to be the usual cause of antral trouble where the reverse is oftener probably the case.

6. Statistics seem to show that a very small per cent. of abscessed teeth have any connection whatever with the antrum—this per cent. probably not being over seven to ten.

7. That seemingly the best place to perforate the antrum for pus, is between the apices of the second bicuspid and first molar.

Since writing the above, I have examined an additional 400 skulls and find the figures changed in regard to the per cent. of abscessed molars which were connected with the antrum. In 500 skulls (*making one thousand antra*) I find 252 upper molars abscessed—making 25 per cent. of antra which have abscesses in this locality or every fourth antrum ; this per cent. is probably smaller than it should be, since many teeth were lost and the alveolar process absorbed away, and undoubtedly some of these lost teeth had been abscessed. Out of these 252 possible cases, perforation into the antrum was found only 12 times, thus showing over 4½ per cent. or about one in every 21 of the abscessed teeth in this locality which communicated with the antrum.

## DISCUSSION.

Dr. Talbot said, having in the last fifteen years made over twenty thousand examinations of skulls, he had found some of the conditions noted by the essayist. Of the skulls of civilized persons he had noticed many of these separations of the antrum, but he had never seen such in ancient skulls or the skulls of pure races. There is a state of things not brought before you by the paper; it is arrest of development of the bones of the face. This is a condition very common, in civilized cities especially. In these cases the antrum is about half the size of the antrum in pure races, and it is such cases where protrusions occur, as shown in the specimens exhibited. He said he would like to ask how the treatment would be carried out where a septum nearly closed the cavity? Would there not have to be two openings? There is much variation in the shape and size of this cavity in different skulls, and it would be well if they were classified as to shape and size and other peculiarities. He had found a number of cases where the opening from the antrum into the nose had been closed up, owing to the arrest of development of the bone.

Dr. Latham said every one knows the difficulty of deciding where to open into the antrum, but she thought the best place was from the socket of the first or second molar, when these teeth are missing or can be extracted. A good way to get rid of the pus, when the patient will help you, is by means of constant irrigation, that is by washing out with the syringe ten or a dozen times a day.

Dr. Clifford said he was impressed with the desirability in cases of antral trouble not to depend upon local treatment. In many cases by treating systemically and getting the system in first rate condition the catarrh will dry up without other treatment. In cases of purulent secretions of any nature, or affecting any part of the system, constitutional treatment is of the greatest importance.

Dr. Fletcher in closing the discussion, said that he had not aimed at going into the question of treatment in his paper, but had wished to present the case in a pathologic and anatomic light. We should find out what a diseased condition is before we undertake to treat it. In regard to the septum in the antrum, he said if the perforation was made just where indicated, and the patient assumed a horizontal position, every part of the antrum would drain, except in a case where the septum extended clear or nearly across, when, of course, there would have to be another perforation. If the first molar is absent the best place for the perforation would be through its socket. In every case he had examined, this would enter the antrum. In treatment he favored both constitutional and local treatment. Some cases are very tedious. He had one now which he had been treating for five months and it was not well yet.

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## Systemic Medication in Dental Practice.

BY EDGAR PALMER, D.D.S., LA CROSSE, WIS.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

Let us consider first our specialty in its physiologic and pathologic aspect.

It is supposed that all who are associated with this Section are of the opinion that "dentistry is a specialty of medicine."

It is sufficient for me to base my remarks upon the simple fact that an all-wise Creator has given man organs of mastication much after the same manner and for an equally important service as the organs of hearing and sight, and these organs being subject to abuse, disease, and functional derangements, thousands of persons are required to devote their lives to their care and treatment. I am aware it is asserted that this great army of scientific men are, by the mechanical character of their methods, too far removed from the province of general medicine to be entitled to the privileges accorded to the oculist or aurist in giving attention to functional disturbances remote from organs over which they have special charge. I confess that my eyes are too weak to see the distinction, and my ears too dull to hear the voice of duty calling louder in one case than another. All the ambition and desire of the last years of my school life was centered upon the one thought of some day entering upon the practice of general medicine and surgery. An empty purse obliged me to take up something else, and as a temporary expedient I took my place at the foot of the ladder upon which the dental profession was then slowly climbing toward the distinguished eminence which it now occupies in the department of science.

The status of dentistry to-day is most gratifying. For many years every force and pressure of intellectual, progressive effort has been brought to bear upon the creation of a higher standard of qualification; and while we have done much, there is opportunity to do more to exalt and commend our services in this general and beneficent cause of humanity.

I can confidently say that now, after more than thirty years' constant practice of this specialty, I am as near the practice of general medicine as I ever expect to be. This branch of the healing art, with its achievements, is good enough, and its resources and beneficent possibilities stimulating enough for any purpose save avarice and greed. The words of Daniel Webster in relation to the practice of law are so germane to this thought that I quote them here:

"Our profession is good if practiced in the spirit of it; it is damnable fraud and iniquity when its true spirit is supplied by a spirit of mischief-making and money-getting. The love of fame is extinguished; every ardent wish for knowledge repressed; conscience put in jeopardy; and the best feelings of the heart indurated by the mean, money-catching, abominable practices which cover with disgrace some of the modern practitioners of law."

The application of the established principles of general medicine was a matter but little considered in the first years of my practice. I frankly say it is comparatively but little understood by me to-day. This much we do know, however, that it is the province of the dentist to search for bodily manifestations in health and disease which may bear upon the interpretation of dental function. We do not deal with the human teeth as though they were a mere mechanism of bone and pulp and nerve, or deal with their functions as an independent agent, with little or no concern or relation to other organs and the whole life of the being, but recognize a vital harmony and essential interdependence—the orderly subordination and co-ordination of parts each dependent upon the other for functional activity.

The magnetic influence and electric force of all nerve-supply, and the effects of fully charged abundant blood courses, bring to our aid a health-giving action upon which we can build pledges of success, while, on the other hand, lacking in vitality, a system with evidences of derangement in formidable disturbances, neurasthenic in character, we are safe in predicting an aggravation if not the direct source of dental lesions.

The only conspicuous inheritance three-fourths of the human race confer upon their offspring is a stunted development and impaired structural formation of the different organs that so universally beget disease.

Temperament and disposition are not more certainly marked upon the child than the impoverished condition of all nerve and blood-supply, from defective nutrition and assimilation, and as such conditions in the child are rarely obliterated during life, they should not be neglected in our practice for physiologic, pathologic, and diagnostic purposes at any time.

The organic origin of pathologic processes influencing local lesions, has for many years impressed itself upon my mind as a subject worthy of our earnest consideration. As long ago as 1878 I was permitted to read a paper before the American Dental Association upon this subject. I say " permitted," because that honorable body has a peculiar system of quarantine, requiring every immigrant, suspected of having contracted germs of progress, to be searched. My paper when returned to me bore a verbal indorsement something like this, in sentiment: We, the undersigned Sanitary Committee, have discovered in this, microscopic traces of an idea, but as we do not regard it of sufficient virility to infect any great number, you have our permission to read it. Whether the idea discovered by that Committee was what I intended to embody in my effort or not, I never learned; but if so, it was this: That the hyperemic condition consequent upon the saturation of the tissues of the body with alcohol, so strangulated the vascular and nerve-supply as to cut off proper nourishment from the dental membranes, and indirectly establishing retrograde metamorphosis of the nerve-fibrils of the tooth, prolific also of neuralgia, and often attended by wasting of tissue, as in decay, under such circumstances of impaired nutrition.

The mysterious force which inhibits itself in the sensitive protoplasm of a muscle is a phenomenon of no less interest to us than to the general practitioner.

The scientific investigations carried on by dentists during the last decade, to put this profession, as well as medical men, in possession of agents which lessen the vital activity of pathogenic parasites, is evidence of an intellectual and progressive spirit most commendable, as well as interesting and valuable to all practitioners of the healing art.

Why, then, let me ask, in view of all that our profession has achieved in this line of scientific work, and in view of our rigid system of dental education in all branches which general medicine requires of other specialists, are we prohibited from exercising this knowledge we are expected to possess, in the treatment of such systemic conditions as directly influence a dental lesion?

Brought daily face to face with all these exciting and retarding influences which you so well understand, must we forever lock the door leading out of the oral vestibule into the wonderful habitation of man's vital forces, and turn the key over to the family physician?

How many dentists, out of two hundred in this country of whom I recently asked the question, do you suppose answered that they prescribed constitutional treatment independent of the counsel or advice of the physician? The number is too few to stimulate me in carrying on the investigation any further.

But notwithstanding the majority of our profession, men whose views are worthy of the highest regard, express themselves as adverse to the practice of administering medicines themselves, I believe the day will come when it shall be considered within the province of the medically educated dentist to make recommendations for general physical ailments affecting the organs given into his care. There must always be a courteous recognition of the rights and duties of the physician, but *within a common sense limit.* I believe "it is better to experience the truth and enjoy its practical uses, even without a perfect knowledge of every theory, than to have full mastery of the theory, but reap no benefits from it."

**Dr. J. Taft** said that it was in the experience of every practitioner of dentistry to have the question raised about the need of systemic medication as a necessary part of the treatment of diseases of the mouth and teeth. He could see no reason why a dentist should not modify by treatment the systemic conditions which hindered the success of his operations in the special line of the profession which he practiced. Why should he not treat the system, as well as the oculist or any other specialist who found the patient in an unfit condition for treatment for the diseases which their specialties would cover? The only reason this question should ever come up in regard to the dentist is because, unfortunately, he is not usually willing or able to diagnose or prescribe for physical conditions outside of the oral cavity. The ophthalmologist, the aurist, and every other specialist, having laid the foundation of their professional skill in the studies of general medicine, and turned their attention afterward to the specialty chosen, are fitted to, and unhesitatingly do prescribe, when necessary to change the conditions of the system, so as to favor the success of the contemplated operation. It is just as important that the dentist should be able to do this as any other specialist.

The diseases of the teeth are influenced by the diseased conditions of the other organs, and it is patent to every intelligent operator that his success in dealing with the teeth and mouth, the diseases of the alveolus, mucous membrane and antral cavities, will depend largely upon whether he can bring the general system to the condition which will favor his success. Until there is a toning up and strengthening of the general system it is often worse than useless for a dentist to operate.

This is not all. There are signs of diseases which come under the dentist's eye more serious than merely a run-down system, and he should be able to recognize such peculiar conditions in a degree, and at least understand the relationship between such conditions and the disease in his peculiar domain, even if he prefer to refer the case to a regular practitioner or specialist in some other branch. The dentist should be able to refer the patient to the physician, giving a fair diagnosis of the case. If a physician received a patient from a dentist with only the message: "Something is the matter; find out what it is and bring about a better state," he would not have a very high opinion of that dentist's standing as a specialist in medicine.

All our medical teaching is based upon the idea that for every specialist a general knowledge of the whole system of medicine is necessary. If it is not necessary for the dentist, why should he study anatomy and physiology? If it is not necessary, why should he study general pathology? It is necessary, for if he does his whole duty in his profession, he must have this knowledge to enable him to recognize and treat such general conditions. And more than that, it is necessary for the treatment of such diseased conditions as are recognized as belonging to his own specialty. The course of an alveolar abscess or necrosis of the jaw is the same as abscess in any other of the soft tissues and necrosis of any other bone.

DR. JOHN S. MARSHALL said that when a dentist did not feel able to treat systemically when it was necessary, it was the fault of our former faulty system of teaching in the dental schools. Until recently it was generally considered that a dentist had no need of the knowledge of general medicine. No one would go with a diseased eye to one who was not a graduate of medicine, and the feeling about dentists should be, as it is about the oculist. The dentist should be as able to treat general disease as any other specialist. He would be sorry if he could not prescribe for any condition which would hinder the success of the treatment for which the patient had come to him. Our field is the mouth, not merely the teeth. We must be able to treat systemic conditions which we observe indications of, and if we are properly educated so as to be able to diagnose them, why should we not?

DR. VIDA A. LATHAM said she would like to ask the Section a question bearing on the subject of the paper, and also upon professional ethics or etiquette. The question is, may a dentist suggest to a physician the necessity for a general line of treatment for disease of the general system? Dr. Latham related the case of a patient of hers, a young man about seventeen years of age, who was a hard student. His teeth had been sound and apparently good until he had an acute attack of pneumonia, when it was found that in the course of about four months, either because of the disease or of the treatment, cavities had appeared in nearly every tooth. When examination was made, the young man was so weak that he fainted in the office. Dr. Latham called the attention of his mother to the state of his teeth as well as to his physical condition, and recommended that he be put in charge of his physician, as she thought there was a serious danger of a relapse into pneumonia. The physician declared that he was in need of no further treatment. The consequence was as she had foreseen, a dangerous relapse, which leaves him at present with a second severe attack of pneumonia. Dr. Latham desired the opinion of the members of the Section as to whether she had done more or less than she should in sending the patient back to the physician for treatment.

Dr. E. S. Talbot said that the whole question of the relations of the dentist to systemic medication and to the general practitioner was affected by the faulty system of dental education, which is entirely wrong. He spoke of a gentleman who held a position in a medical college and also in a dental college. The faculty of the medical college was pleased with him, but after the first year the faculty of the dental college declared that his lectures were too far advanced for the dental students; that they did not care to go so deep into things, and they were dissatisfied with him on that account.

The condition and the ambition of the dental student of to-day is little better and little higher than it was twenty-five years ago. He only cares, in most cases, for just enough general medical and physiologic knowledge to get for him the diploma, and when he has secured that he forgets all that is not, in his opinion, necessary for his success as a dentist.

The specialists in other departments do not feel so. They generally have practiced a few years at least before taking up a specialty, and are competent to treat any diseased condition which presents itself to them. The dentist, on the other hand, could not diagnose diseases of the general system, and not being a graduate in medicine would not dare to treat them. For himself, he said that his education was all the wrong end front, as he had practiced before attending any college, and afterward had taken a medical degree. The proper course would be the exact reverse of this. First the medical degree, next the dental, and afterward the practice. There are comparatively few of his patients that he does not prescribe for systemically. He has no sort of hesitation in considering himself a part and parcel of the medical profession, and in such a case as Dr. Latham reports he would go to the family physician and point out to him the condition of the young man and his need of treatment. He often has cases where he sees conditions which make it necessary to send the patient to a physician.

DR. EDGAR PALMER said that he thought when a patient whose physical condition was such as to make it impossible for the dental work needed to be done came to the office, the dentist should prescribe what will alleviate the condition. There is a long list of troubles we do prescribe for, in preparing the system for the surgical operations in the mouth ; but of course there is a common sense limit, and we should not take upon ourselves the responsibilities of the general practitioner.

DR JOHN S. MARSHALL said Dr. Latham's question had not been fully answered yet. It was, had she the right to go to the physician and report what she had discovered ? He though she not only had the right, but that it was a duty.

DR. GEORGE V. I. BROWN agreed with the ideas which had been advanced, but thought that the education of dentists is improving and rapidly, too. The dentist should know how to prescribe, but should be careful not to encroach on the field of the general practitioner, and so raise feelings of jealousy. More trouble comes to the physician's patients from not consulting the dentist than comes to the dentist's patients from not consulting the physician. If he had a patient who was not getting from his physician proper treatment, he would not hesitate to recommend a change of physicians. This would rarely be necessary, but sometimes it would.

DR. ANDERSON said he saw no reason why the dentist should not apply all the knowledge he had in any direction for the benefit of his patients. If, however, the dentist neglects his own specialty to learn to practice general medicine, he would lose opportunities for advancement in his own special line.

DR. W. H. CARSON said that to discuss the question asked by Dr. Latham was equivalent to admitting that we were not specialists in medicine. If we are members of the medical profession, then, of course, we should consult with the family physician.

Unfortunately, the majority of the dentists are not properly educated; they are not competent even to write a prescription. This should be changed; we should be physicians first and specialists afterward. Dentistry is looked upon by students as a more easily acquired profession than medicine, and those who are unable to acquire the latter feel that the former is within their reach, and thus it comes that the class of students at dental colleges are less highly prepared, educationally, and probably mentally, too. This should be changed; as much should be required of the dental student in the way of study as of the medical student, and the requirements for matriculation to the dental student should be as high.

Dr. Taft regretted that the mass of the profession did not appreciate the necessity of a good general education as a foundation for the professional education. The low standard of education required for entering the colleges is not so much the fault of these institutions as it is the fault of the profession. Almost every student is sent to the college either directly from the office of a preceptor or, at least, has taken the advice of some dentist as to the step. This is where our responsibility is. If an unfit man asks your advice about studying dentistry, persuade him not to study it. Most of the dentists have very little knowledge of general medicine, yet if they would they could get this knowledge, and they should take hold and master it, and they would do so if they could appreciate the necessity for it. On the other hand, the medical profession do not appreciate the diseases of the mouth. This is because they have so many things in their course of study that the diseases of the special organs are not taught thoroughly in the colleges.

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Dr. Annie Felton Reynolds, of Boston, who read a paper before the Dental Congress in Chicago, was the first woman to be graduated from a New England Dental College. She was one of two women to speak before the Dental Congress.

# Abstract—Chairman's Address.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

A. E. BALDWIN, M D., D.D.S. CHICAGO, ILL.

The demand for a more thorough education in all departments of medicine stimulates us to action to keep abreast of the times, and we must exercise great wisdom and judgment to always know what new ideas are worthy of fostering and adoption, and what are unworthy of our serious attention. A great danger at present in all walks of life is to fadism, and with us there is danger that in our enthusiastic adoption of some new theory, we do *not* make use of, or realize, the sterling worth of the old, approved and established ideas. We are reminded of this in the now all-absorbing fad of laying the guilt of every ill to micro-organisms, and perhaps in using agents destructive of these, when instead we should use the greatest of all healing and healthful agents alone, and that is cleanliness.

We are further reminded of this in our specialty, when we say there is great danger that in formulating and exemplifying theories of the causes of decay and germ-destroying methods, we may forget that *whatever* the cause of decay, when it is present in the tooth, it should be removed, so that at least in the external walls there be nothing left save that which is healthy, and then by proper adaptation, our work will be as secure from failure as is possible. We do not mean that broad and thorough work and research should be discouraged, but instead, heartily recommended; but what should be discouraged and condemned is the so-called research, which is rather intended to fortify or prove some preconceived idea. The greatest danger in our special field is to narrowness and the lack of patient and earnest search after wisdom in the broader fields. The broader we become as students, the less need will there be of any hampering or stiff boundary lines of rules of ethics, and the more surely the golden rule of "doing as we would be done by" will prevail, and that spontaneously. When we realize how broad the world of wisdom is, we will cease to even imagine great learning in ourselves. We think the attention of the general practitioner should with great emphasis be directed to the necessity of preserving the temporary teeth, especially the temporary molars, for they are not usually replaced by the permanent until the tenth to the twelfth year. The importance of this will be realized, when attention is called to the fact that the child needs well-masticated nutriment much more than does the adult, for their system needs not only material to supply the waste, but also for the rapid growth and development of the whole physical organization. *Again*, if these teeth are neglected, they soon become sensitive, and then the child will not properly masticate the food, but forms the habit of bolting his food, thus introducing the whole train of dyspeptic troubles. *Again*, children's teeth, whether sound or decayed, should only be extracted when the new or permanent tooth to take its place is ready to come in; then only the *one tooth* should be extracted, for in the writer's opinion, one of the most fruitful causes for irregularity in the permanent teeth, is the extraction of more than the one temporary tooth to allow the larger permanent tooth room to come in, forgetting that while coming in apparently with much irregularity oftentimes, they will as a rule regulate themselves by expanding the jaw, before the age of twelve or fourteen years, and this expansion of the jaw is a necessity to the physiologic development of the normal face. And that, recognizing the fact of the natural tendency of the teeth to move forward, or toward the mesial line, the natural sequence of the extraction of a temporary tooth, before the time for the eruption of the corresponding permanent tooth, will be the partial or complete closure of the space, so the permanent tooth when it comes in will have such a restricted space that an irregularity must result.

Another thing is the failure of the general practitioner in not recognizing that, in the great majority of cases, an abscessed tooth may, by proper treatment, be made so that it will give satisfactory service for many years, being almost universally amenable to treatment and filling. So that the field for the judicious extraction of the teeth has been narrowed to a very meager number. And in this connection, the writer expresses the opinion that the persistent, often repeated and long continued treatment of these pulpless teeth is most often needless, and entailing unnecessary expense and trouble to the patient; and that the end may be attained usually in one sitting, *provided*, that the roots can be and are cleaned out and made perfectly dry, and a non-irritable and complete filling placed therein. And if any irritation follows, this can be better treated from without than through the small and often tortuous root-canals. In fact, it is extremely rare that with careful and thorough work, the pericemental irritation, if present at all, will be more than so very slight as to be scarcely noticed.

## Some Points on the Articulation of Teeth.

BY G. MOLYNEAUX, D.D.S., CINCINNATI, O.

Read before the Ohio State Dental Society, December, 1893.

The downfall of mechanical dentistry has been attributed to two causes, namely: the introduction of vulcanite for artificial dentures and nitrous oxide gas. The deplorable condition into which mechanical dentistry has fallen through vulcanite is not due so much to the fact that vulcanite as a base for artificial dentures is bad, for it is not, but to the fact that from the ease of manipulating this material a large number of persons have entered this profession who are entirely oblivious to anything more than jewelry work, losing sight entirely of the essential features—those features which make a denture of the greatest utility and beauty.

Of the many offices of the natural teeth there is none of greater importance than the mastication of the food. The thorough exercise of the teeth in mastication has been deemed a necessary concomitant to the process of digestion, and it is necessary, in order to maintain the health and comfort of the digestive organs, that this function shall be thoroughly performed. If in the insertion of an artificial denture we fail to provide a means for the thorough mastication of the food, so far as practical in each case, our instrument is virtually a failure. The means for properly masticating the food infers a perfect articulation of the teeth; not only the articulation of the teeth during the occlusion of the jaws, but also during the various movements of the lower jaw in the acts of incising and grinding the food. The lower jaw, on account of its peculiar form and movements, has the power of bringing the teeth into various relations to each other for the purpose; first, of incising the food, when both condyles of the lower jaw move forward in the glenoid fossæ, and the cutting edges of the incisor teeth are brought opposite each other for the purpose of separating a small portion of food from the main bulk prior to the process of mastication.

During mastication, instead of moving both condyles, one condyle only moves forward in the glenoid fossa protruding the lower jaw either to one side or the other, and this lateral protrusion followed by a drawing of the jaw back into the position of occlusion is a provision whereby the cusps of the bicuspid and molar teeth, if they are in proper relation to each other, can be utilized for the trituration of the food. It is an impossibility for the human race to masticate upon both sides of the mouth at the same time, and yet I have heard many practitioners in explaining to patients how to use an artificial denture, when they complain of tilting of the plates, that they must learn to chew on both sides at the same time.

It is a fact owing to careless methods in vogue that the movements of the lower jaw, for the purpose of mastication, with a large per cent. of artificial dentures is restricted simply to the up and down movement, or the same movement as in occlusion, and when the patients learn to control the lower jaw and make only the movements of occlusion they only then begin to feel that the denture is a success. By such movement of the jaw instead of mastication the patient is limited to only a mashing of the food and the swallowing without the proper insalivation, which occurs during the free and unrestricted use of the lower jaw. Now, to construct an artificial denture that will permit of the free and unrestricted use of the lower jaw several points must be carefully considered, and these cannot be better presented than in the language of the author of a system of articulating artificial teeth, which I am expected to demonstrate this evening. Dr. Bonwill, in an article entitled the Geometrical and Mechanical Laws of the Articulation of the Human Teeth, found in the "American System of Dentistry," pages 496 to 498 inclusive, calls attention to a few conditions which he says exist in every normally articulated natural denture, and with a special apparatus of his own invention called the Anatomical Articulator he applies his conclusions to the arrangement of artificial teeth. His first important observation is with reference to the shape of the lower jaw, it being of a peculiar tripod arrangement and forming an equilateral triangle, "From the center of one condyle to the center of the other four inches is about the average, and it will also be found that from the center of each condyloid process to the median line at a point where the inferior centrals touch at the cutting edge is also four inches." These angles, he claims, vary never more than half an inch, which would make little difference in describing the arc of a circle. "No matter what the width from one condyloid process to the opposite process the distance is the same from the processes to the median

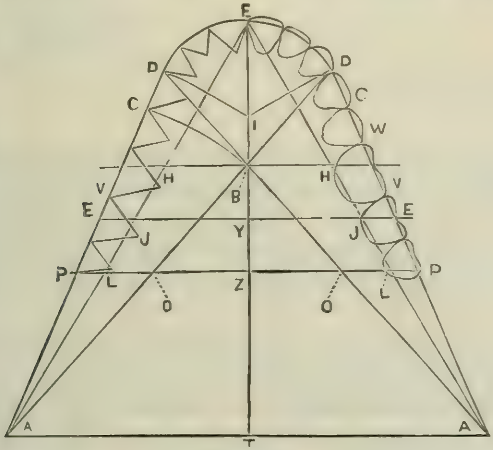


Fig. 9.

line of the lower jaw at the cutting edge of the central incisor teeth. The jaw forms a perfect triangle, for the purpose of bringing into contact the largest amount of grinding surfaces of the bicuspids and molars, and at the same time have the incisors on one side at once come into action during these lateral movements. It will also be found that from the cuspids, the bicuspids and molars run in nearly a straight line (Fig. 9) instead of a circular one, back towards the condyloid process, enabling them to keep the largest amount of surface always presented for mastication. The next important observation has reference to the position and relation of the incisor teeth. The upper incisors should overjut the lower incisors, while the lower have a corresponding underbite; without this arrangement the incisor teeth would lose their function. Were the incisors to strike

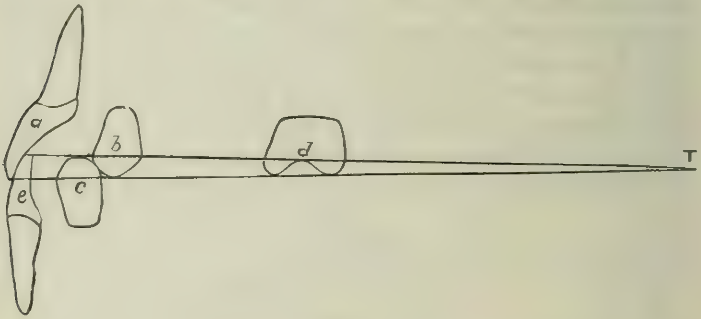


Fig. 11

directly upon each other the power to cut off food would be very much lessened. The normal arrangement of the incisor teeth is shown in Fig. 11. Now, where there is an overbite and an underbite of the incisor teeth, just in proportion to their depth will be the length of the cusps of the cuspids, bicuspids and molars."

The next observation has reference to the curvature of the teeth in the jaw, which is formed by a dipping down of the second bicuspid and shortening of the posterior cusp, with a turning upward of the second and first molar teeth toward the condyle of the jaw, as illustrated in Fig. 17, which is reproduced from a life-size engraving from Black's Dental Anatomy. This vertical curvature "commences at the first molar tooth, although it shows itself slightly at the bicuspid, practically it need only commence

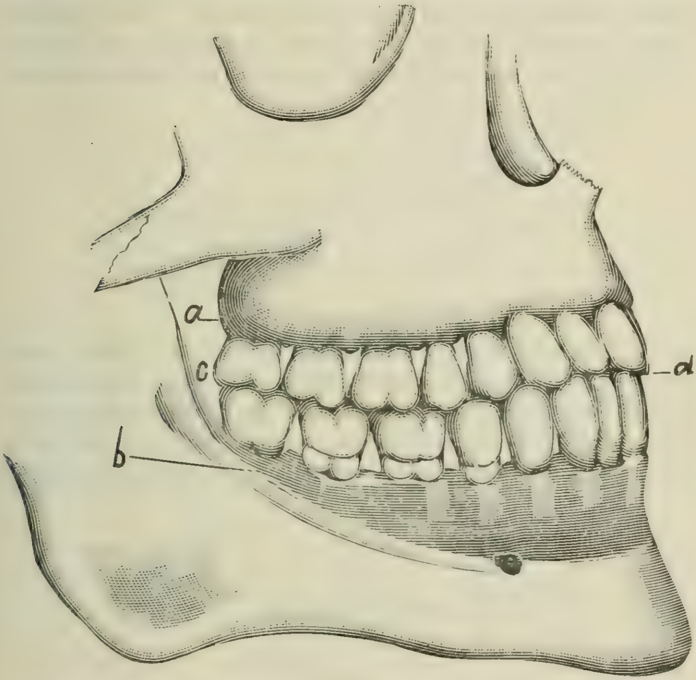


Fig. 17.

at the first molar, and this curvature is proportioned to the underbite and overbite of the incisor teeth." The purpose of this curvature at the ramus, as shown in Figs. 14 and 15, is obvious; when the lower jaw is protruded during the incisive function the molar teeth are in contact at the same time as the cutting edge of the incisor teeth, while the cuspids and bicuspids swing free. This arrangement prevents anything more than mere contact of the incisor teeth, and applying the principle to the arrangement of artificial teeth it establishes a contact at the heel of the plate at the same time that the incisor teeth strike, and prevents the displacement of the dentures. The length of the cusps of the bicuspid and molar teeth has a definite relation to the lateral movement of the lower jaw. The buccal cusps of the lower bicuspids and molar teeth are usually shorter than the lingual cusps, while the reverse is true of the upper bicuspids and molars. The purpose of this arrangement can be easily seen by referring to Fig. 12. When the lower jaw is protruded to the left side as in the figure, and mastication is being performed on the left side of the mouth, the cusps, both the lingual and buccal, are found opposite each other while the food is pressed into the sulcus between these cusps. Now, if there is no contact upon the opposite side of the mouth the plate would be in great danger of tilting or dropping on the side opposite the one in use. But, by the proper shaping of the cusps of the bicuspids and molars we find that we can obtain upon the opposite side of the mouth contact between the lingual cusps of the upper molar teeth and buccal cusps of the lower molars, which prevents displacement of the denture opposite the side in action. As the lower jaw is drawn into position, the buccal cusps of the lower molars traveling into the sulcus and toward the lingual cusps of the upper molars on the side in use, we find the buccal cusps of the opposite lower molars traveling toward the buccal cusp of the upper molar on the side not in use, keeping a a constant contact for the purpose of supporting the denture upon

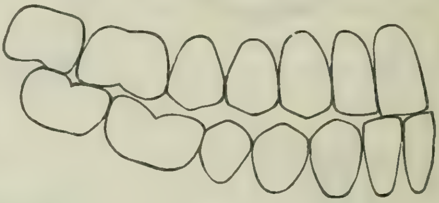


Fig. 14.

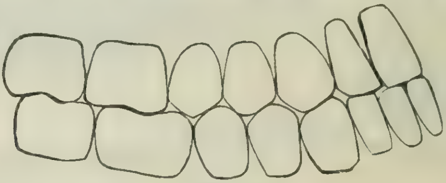


Fig. 15.

that side of the mouth during mastication on the opposite side. The same principle holds good when mastication is performed on either side of the mouth. Fig. 2 shows the position of molars and

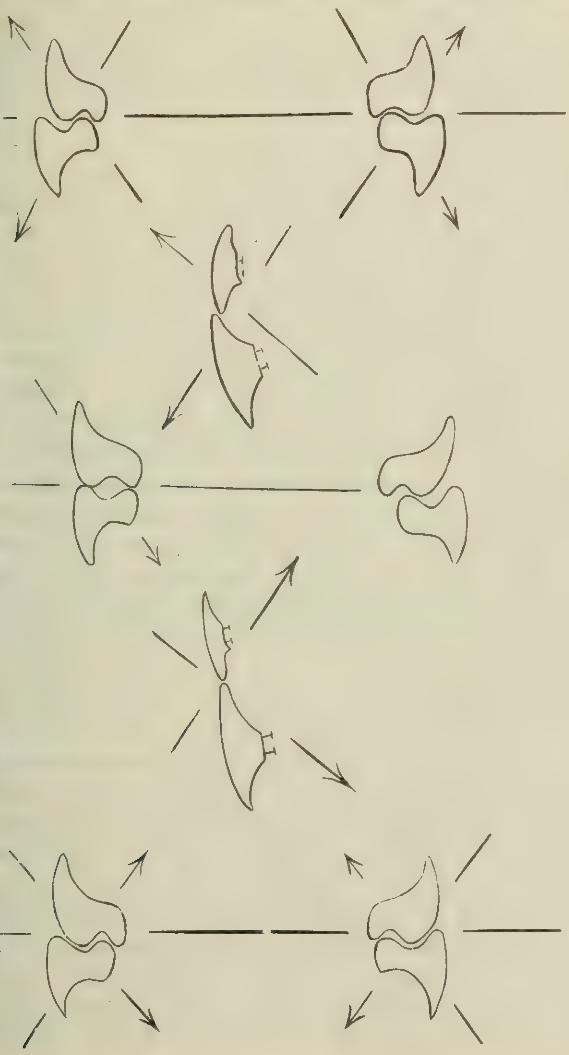


Fig. 1.

Fig. 4.

Fig 2.

Fig. 5.

Fig. 3.

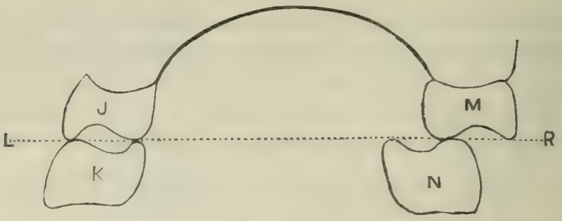


Fig. 12.

bicuspids during mastication on the right side, Fig. 12 during mastication on left side, with a balancing contact of the molar teeth on the opposide side of the mouth.

The next observation made by Dr. Bonwill has reference to the relative position and size of the teeth in the arch. This is illustrated in Fig. 9. An equilateral triangle is formed with a base corresponding to a line drawn from the center of one condyle of the lower jaw to the center of the opposite condyle, and represented by the points "A—A" in the figure. From the points "A—A" a line is taken to the cutting edge of the central incisor teeth at the median line which represents the apex of the triangle, and it is usually about four inches in length. We now take a pair of dividers and obtain the combined width of the superior central, lateral and cuspid teeth on one side. A line is now drawn from the point "F," or the cutting edge of the superior central incisors at the median line, to a point midway between the condyles, or midway between the points "A—A," Fig. 9. This line from "F" to "T" in the diagram represents the median line of the mouth throughout its entire extent. The point of the dividers is now placed at the cutting edge of the superior centrals at point "F," while the other foot of the divider is placed at point "I" on the median line or just the distance of the width of the superior central, lateral and cuspid teeth on one side. The point of the divider resting at "I" is held firmly in position, while the point of the divider at "F" is made free and a complete circle described. The anterior segment of this circle which intersects the median line at "F" gives the exact size of the arch as it falls directly upon the cutting edges of the incisor and cuspid teeth. It marks the extreme limit and prominence of the cuspid tooth. If a line be drawn at right angle to the point where this circle intersects the median line at " Y," (or twice the distance of the combined width of the superior central, lateral and cuspid), from the apex of the triangle, " it will fall through the center of the second molar tooth." After arranging the six anterior teeth according to the measurements given, a straight line is taken from the condyle of one side of the mouth to the distal surface of the cuspid tooth on the opposite side of the mouth. Another line is drawn from the condyle on the opposite side to the cuspid tooth on the opposite side at its distal surface. These lines intersect the median line at " B." Dr. Bonwill claims that a line drawn at right angles to the median line at the point " B " will fall through the center of the first molar tooth. I would say with reference to this line that its position can be slightly altered according as the width of the incisor teeth is greater or less, and also the width of the bicuspid teeth, but the difference is so slight that it makes very little practical difference in the arrangement of an artificial set of teeth. By reference to Fig. 16, which is taken from life-size engraving in Black's Anatomy and enlarged, keeping the proportions as nearly accurate as possible, you will find that the horizontal line falls through the middle of the distal buccal lobe of the first molar tooth, instead of through the center of that tooth.

The arrangement as shown in Black's Anatomy has been more universal in the measurements that I have made than that shown in Dr. Bonwill's diagram.

We now take our dividers and place one point of the divider at " A," and the opposite point of the divider at " B;" we describe a curve toward the buccal surface of the mouth from " B," and we find that this gives us a space between the curve and distal surface of the cuspid tooth, which fixes the width of the first bicuspid tooth. We keep one point of the divider at " A " and we retract the other point to " I;" we describe a second outward curve, and the space between these curved lines gives the exact width of the second bicuspid tooth. The next line is taken from a point at the distal surface of the cuspid tooth to the condyle of the jaw, which Dr. Bonwill claims will pass through the buccal cusps of the bicuspid and molar teeth. In every instance that I have made the measurement, where I have found the arrangement of the teeth approximating the natural or normal, I have found this line to deviate slightly from the diagram shown by Dr. Bonwill. If we refer again to Fig. 16 we find that the two bicuspids and first molars will fall with their buccal cusps upon this line, while the second molar is turned inward toward the

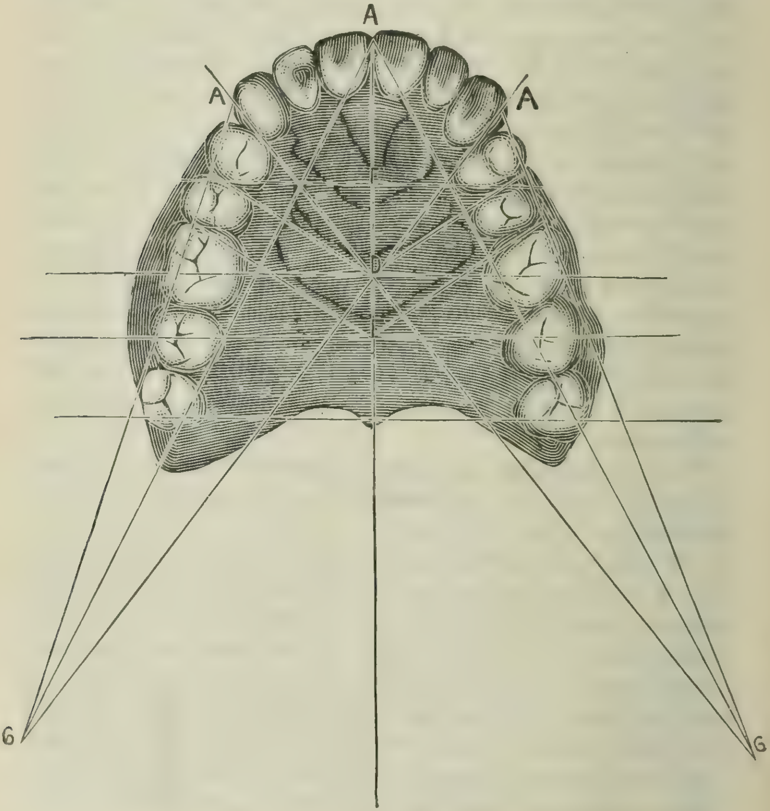


Fig. 16.

median line of the mouth, and is missed entirely by the line from "A" to "C," Fig. 16.

This seems to me to be a more advisable arrangement of artificial teeth, for if the diagram of Dr. Bonwill is followed exactly, the distal buccal cusps of the second molars are thrown too far from the ridge, and there is great danger of excessive leverage at this point, which would not be the case if the second molar was turned toward the median line, as shown in Fig. 16. With the exception of this tooth and the position of the line which defines the center of the first molar I have found no exception to Dr. Bonwill's measurement. There are some other points in connection with this subject which I desire to make, and which I think are of great importance in the arrangement of artificial teeth. I regret exceedingly that Dr. Bonwill did not have more to say in his article on the articulation of the teeth about this point, viz: the angles of force during the acts of incising the food and mastication. When teeth are firmly imbedded in the alveolar process and supported by each other a slight change in the angle of position of these teeth in the process is of very little importance practically, but the angles of the teeth on an artificial denture contribute largely to the successful or unsuccessful use of that denture. The remarks made by Dr. Bonwill have direct application to the support of artificial dentures when the cutting edges of the teeth are in contact or in positive mastication, but there is nothing said about supporting the denture while the food is between the teeth and before the cutting edges strike. It is absolutely necessary to consider the lines of force, or the mechanical forces, during the incisive function and during mastication, in order to support the denture before the cutting edges of the teeth come into actual contact. By reference to diagram "A" I have tried to outline the position of the incisors, bicuspids and molar teeth on opposite sides of the mouth, indicating the lines of pressure during the incisive function and during mastication, by darts. In a large number of cases where there is excessive absorption of the ridges it is a rule with a great many operators to lean the cutting edge of the incisor teeth toward the lip, while the cervix of the tooth is inclined toward the alveolar ridge; the same is true of the lower incisor teeth, and is indicated by Fig. 5. If the mouth is thrown open and there is an attempt to incise with the teeth in this position, the pressure from the lower tooth is against the inner or lingual cutting edge of the upper incisor tooth, and the angle of pressure is, according to the dart, from "B" to "A," which would cause a tilting of the plate at the heel; because, there being food between the incisor teeth, there is no contact between the molars. An arrangement of this kind, as shown by Fig. 5, would have a tendency, as can be seen by the angle of these teeth, to displace, by tilting, both dentures at the heel. Referring now to Fig. 4 we find that by inclining the cervix of the superior incisor outward and the cutting edge of the inferior incisor inward, that the line of pressure is toward

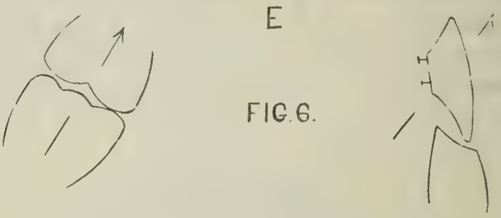


FIG. 6.

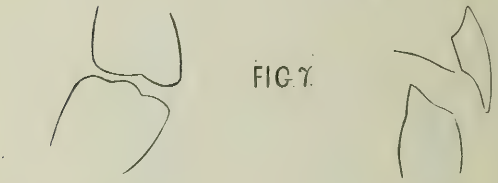


FIG. 7.

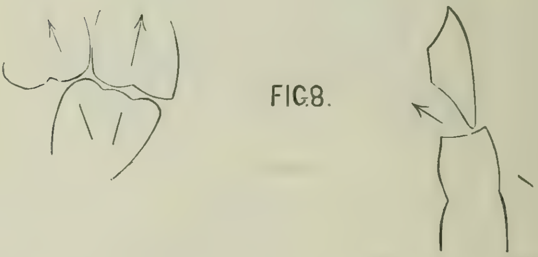


FIG. 8.

the center of the palate above and against the labial cutting edge of the incisor, thereby supporting the denture during the process of biting through the food. While this arrangement may not be wholly in accordance with a natural denture, and is slightly exaggerated in the figure, the appearance is much better in an artificial set than the same arrangement might be in the natural teeth. The slight change of these angles does not materially effect the appearance of an artificial denture. If we refer now to Fig. 3, which is an arrangement of the bicuspids and molars that usually accompanies Fig. 5, by the leaning in of the cervix toward the alveolar ridge, it can readily be seen that when there is food between the teeth and pressure is exerted, bringing the lower teeth against the upper, that the pressure would be represented by a line from " A " to " B," and that this pressure toward the buccal surface would tend to displace the denture upon the opposite side of the mouth. If we refer now to Fig. 1 we see that the cervix is inclined away from the ridge, while the cutting edges are inclined toward the center of the mouth. If the food be now grasped between the teeth arranged according to this diagram the line of force would be as indicated in Fig. 2; the pressure being upon the buccal surface toward the center of the palate, while in the lower it would be toward the median line of the floor of the mouth, as indicated by the darts.

When the jaw is protruded laterally for the purpose of triturating the food it is gradually retracted, drawn upward and toward the position of occlusion.

Now, until the cutting edges of the teeth strike, the pressure would be toward and against the lingual cusp of the upper molar in the sulcate groove. It will readily be seen that pressure against this point would support, or tend to support, the denture on the opposite side of the mouth. If the angles of the teeth are arranged properly there will be no displacement of the denture while biting through the food until the cutting edges of the teeth strike; there would be no displacement then unless upon the opposite side of the mouth there was no balancing contact. The real act of mastication occurs after the cutting edges of bicuspids and molars strike, and if, at this time, we have contact upon the opposite side of the mouth we find that the denture would be constantly supported. By reference again to Fig. 2 we see the lines of force indicated until the cutting edges of the teeth strike, as the lower jaw is retracted and the buccal cusps of the lower teeth striking the buccal cusps of the upper, the molars and bicuspids begin to travel, the food being pressed in the sulcate groove between the cusps, upward and toward the position of occlusion, the buccal cusps following into the sulcus of the upper tooth, while the lingual cusps of the lower molar travel over the lingual cusps of the upper molar. During all of this time we find the buccal cusps of the lower molar on the opposite side traveling into the sulcus of the upper molar and toward its buccal cusp, keeping a balancing contact on the side opposite the one in action. These points can be, probably, more clearly demonstrated by reference to diagram " E," Fig. 6; here is shown a case of lower central incisors and cuspids with their abraded cutting edges beveled away from the lingual surface toward the labial side of the tooth. We find that the second molar tooth tilts forward owing to a loss of the first molar and bicuspid teeth. This case, which is taken from nature, and of which I have the model here to illustrate, is not infrequently found in practice. In the case in question the gentleman has had several dentures made and was unable to use either of them, for the reason as shown by the arrangement of the incisor and molar artificial teeth. At every attempt to close the mouth when there was food between the teeth the pressure was against the lingual surface of the superior incisor and toward the lip, while the molar tooth antagonizing with the natural lower tooth was inclined at an angle, as illustrated in Fig. 6. It can be readily seen that pressure against the artificial denture in this case is to force it off the ridge; first, to tilt it by pressure against the incisor; secondly, to force the denture from the ridge by pressure against the artificial molar. The second denture was constructed after the plan of Fig. 7. Instead of inclining the artificial molar it was placed nearly upon a perpendicular plane, while the cutting edge was sloped away toward the distal surface in order to antagonize the tooth. The arrangement of the incisors in this plate was as indicated in Fig. 7. The upper incisor swinging clear of the lower tooth and allowing the lower incisor teeth to strike against the base plate of the denture. In this case the same conditions would hold as in Fig. 6. The line of force is from the distal portion of the plate toward the front of the mouth, and the denture was constantly thrown off the ridge. The manner after which we constructed our appliance, and one which has been worn quite successfully, is shown in Fig. 8. The long projecting inner extension of the lingual surface of the incisor was ground away, as indicated in Fig. 8. It is impossible and quite unnatural to adjust an artificial denture with an overbite and with cusps, in such a case as illustrated in Fig. 8. The cutting edges of the lower natural incisors were slightly grooved, as shown by the figure; while the molar tooth, the first superior molar artificial, was arranged practically as shown in Fig. 7, but in addition to this we arranged the second molar upon the denture, bringing a bearing against the distal surface of the lower natural molar. The provision of this arrangement is quite obvious; during biting upon the front teeth the line of pressure was against the labial cutting edge and toward the center of the palate, as shown by the darts, and while the denture was thus supported anteriorly at the same time of occlusion, in the region of the molars we find the pressure exerted in both directions, and by the tilting of the second molar against the distal surface of the lower natural molar we find the pressure exerted in a manner that would hold the denture firmly against the ridge and prevent its displacement. It is a strange feature that a subject of so great importance has been so long neglected in the literature of mechanical dentistry. The article of Dr. Bonwill's on this subject: "the Articulation of Artificial Teeth," is the first and only literature of any scientific merit in this direction, and after an experience of over six years carefully following his methods of articulating artificial teeth we are prepared to state that our results have been universally satisfactory. If we expect to recover from the present state into which mechanical dentistry has fallen it must be by the study and adoption of such theories as those advanced by Dr. Bonwill. While there may be some criticism as to the conclusions upon the observations he has made, the profession is certainly deeply indebted for such a perfect guide to the articulation of artificial teeth. The subject is of too great importance to be passed without serious consideration, and the moment the intelligent part of the dental profession begin to adopt and apply, carefully, such methods, or require their mechanics to adopt them, they will at once raise the status of the prosthetic art, and a mechanical dentist will be recognized as a scientific man. With the observations before us, it remains to adopt some apparatus by which we can study and obtain the various movements of the lower jaw out of the mouth.—As we have seen by the preceding that the overbite of the incisor teeth, the position of the teeth in the arch, the vertical curvature in the bicuspid and molar region, the length of the cusps, all have a definite relation to each other and cannot be followed abstractly. One cannot hope to carry out the provisions of this articulation without having the means of accurate measurement. We have the vertical curvature in the molar region, of what service is this curvature unless proportioned properly to the overbite? If we place the incisor teeth, as many operators do, with a very slight overlap, "or only enough to prevent hissing," as the books tell us, we at once sacrifice to a large extent the incisive function of the incisor teeth; not only this, but the appearance of the incisor teeth is quite unnatural. If the incisor teeth are arranged regardless of the position of the molars and the natural amount of overlap given, then lateral movements of the jaw will be interfered with, and the patient will be restricted simply to the up and down movements of the jaw. We must adopt a means whereby these various conditions can be measured or relatively proportioned out of the mouth, and this cannot be accomplished without being able to obtain the movements of the lower jaw. The only instrument for this purpose is found in the Anatomical Articulator.

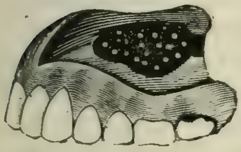
N. B.—Nos. 16 and 17 are reproduced from Black's Dental Anatomy, only using enough of original figure to show relation and position of the teeth.

Nos. 9, 11, 14 and 15 are reproduced from original drawings by Dr. Bonwill as they serve completely the purposes of the paper.

In a subsequent issue the "Anatomical Articulator," and how to use it, will be discussed, when further allusion will be made to the engraving of this issue, and it should therefore be preserved.

## A Plate Retainer.

BY WM. H. STEELE, FOREST CITY, IOWA.



The following plan has been in use in my practice for several years, and has proved a perfect success in overcoming those difficult cases, where we have a *soft alveolar ridge* in connection with a very firm, hard palate. Take the impression with Teague's compound, and make cast as usual; after the cast is hard enough for the base plate, examine the mouth carefully and locate the margins of the hard palate. Cut a pattern from heavy paper, the proper size and shape to cover this part of the mouth; now place this pattern on a piece of tin of the proper thickness, and cut out a fac simile of the paper; fit this on the plaster cast *exactly* in the same position that the pattern was fitted to in the mouth; press it firmly to place, and fasten with cement, or a couple of pins. Now make the base plate, and mount in the articulator as usual; in grinding up be careful to get a *perfect* articulation; invest as usual, remove the wax and pack with best maroon or black rubber until there is just enough for the plate. Then cut a piece of the cloth, which comes with the rubber, large enough to fully cover the cast, and lay over it in order that the flask may be easily opened; bring the flask *entirely* together. Open and remove the cloth and the tin pattern from the cast. Fold sheets of black soft *palate* rubber, until it is one half thicker than the tin; lay the pattern on this and cut the rubber same shape and size. Place this piece of rubber in the depression made in the rubber by the tin pattern. Close and vulcanize as usual. When the plate is all finished, pit the surface all over as shown in the cut, with a number seven round bur, while doing this, the rubber and bur must be kept wet. The soft rubber should follow the hard ridge entirely back to the heel of plate as shown in cut. The thickness of the soft rubber should be governed by the variation in difference between the hard and soft tissues, and often the tin pattern should be thinned with a file in some parts before fasten-ing to cast, in order to make the soft rubber thickest in the hardest part of the arch.

## Special Notice.

As it takes too much time to answer personally all the letters of inquiry I get from brother dentists, I am having a little illustrated leaflet printed explaining Alloy Crowns, Combination Fillings, etc. This will be ready about April 1st, and will be cheerfully mailed to all who address me with stamps.

WM. H. STEELE, Forest City, Iowa.

# SELECTIONS.

## Squelching a Quack.

JERSEYVILLE, ILL., Jan. 20, 1894.

*To the Editor:*—The State Board of Health, through Judge O. B. Hamilton, brought suit in this city against one "Dr." Fred Blankner, who was traveling through this region advertising himself and wife as the "champion tooth-pullers of the world," by flaming posters and advertisements in the local papers. This interesting couple also sold electric belts and "yaw soap," which last was recommended as an unfailing cure for sundry and divers diseases. A judgment was recovered against the defendant for $100 and costs, with an order that he stand committed in custody until fine and costs were paid. The wily faker took the train for St. Louis before the jury returned their verdict, and so he is still at large.

The technical charge against him was that of violation of Section 11 of the Medical Practice Act, Chap. 91 R. S. of Illinois, as an itinerant vendor of drugs, without license from the State Board of Health.

The squelching of this quack will doubtless prove beneficial.

Yours truly, MEDICUS.

*Journal American Medical Association.*

# Importance of Dyspepsia.

BY HUGH MATHEWSON PATTON, M.D., MONTREAL, CANADA.

It has been estimated that nine-tenths of the cases of heart disease, kidney disease and rheumatism have origin in the faulty assimilation of the food; the remaining tenth finding their source in the misuse of alcohol, accident and exposure. This leaves out heredity, and presupposes the individual to have started life with a set of organs in working order. So that if the physician will bend his energies to the correction of the habits which lead to indigestion, before organic disease superimposes simple deranged function, he will, in a large proportion of cases, restore his patient to the comfort ensuing from smoothly-working organs, and ward off organic disease in the organs noted above.

Crossing over a few days ago from Ireland, a prominent Montrealer asked my advice in regard to what he spoke of as swelling in his feet. He was a magnificent specimen of a man, but the slight bluish tinge of his lips and florid cheeks pointed to defective venous return. I examined him carefully, found slight edema of lower extremities, heart sounds normal, but very faint. A condition which I have learned by experience results in organic heart disease in a very short time.

I questioned him carefully in regard to his eating, and he assured me that no one could be more careful. I gave him nux vom. 2x before meals, and digitalis two drop doses, between meals, but the improvement was very slight.

Coming up the river I sat near him, and observed that while he carefully abstained from so-called indigestible foods, that what he did take was chewed two or three times and then *bolted* down by muscular force.

When I next saw him I mentioned this habit, and told him plainly that he would develop organic heart disease unless his food was properly eaten. He has wisely followed the suggestions, with a result that the dropsy has gone and his face assumed a normal color.

Just as an engine and boiler will get clogged up and work inefficiently, if the fuel is not properly burned, so will the human system get clogged up and work badly if the fuel is not properly assimilated. Hence, before I start to load a man up with drugs, I find out if he is giving the digestive juices of his body a fair chance.

I insist most strongly on a man eating at one time and drinking at another. If he takes his food dry, he must perforce chew it thoroughly. If he drinks when his stomach is empty, there is no waste of digestive juices, and the liquid which is not absorbed to meet the liquid needs of the tissues tends to waste away the catarrhal mucus which coats every disordered stomach and intestine.

To remove as far as possible the tendency to thirst at meal time I ask him to drink a glass of hot water, or hot milk and water one hour before each meal and bed time. To give the saliva a chance to digest the starchy elements of his food I ask him to chew his food so thoroughly that it will slip down his throat without effort.

The constant use of tea and coffee is on the same level with the constant use of alcohol—all admirable stimulants and adjuvants when used occasionally, but creating a craving habit, if constantly taken.

I advise him a good hour's walk daily, and morning and evening a five minutes' easy seance with the Goodyear Pocket Gymnasium, manufactured by Mr. Leonard, of Hodgman Brothers, Broadway.

The drugs which I have found were useful are carbo. veg. 5x, pulsatilla 3x, mercurius sol. 3x, bryonia 3x, hepar sulphur 5x, sulphur 6x, arsenic 5x, and cinchona 3x.

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BICYCLE riding has proved curative in several cases of persistent sciatica.

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THE item which is going the rounds quoting Dr. Lawson Tait as saying, "I pay not the slightest regard to sterilization of any kind; the whole of such precautions are farcial," reminds one of the reputed saying of Mark Twain, "I believe so thoroughly in total abstinence that I totally abstain from total abstinence itself." One of our leading operators in Chicago used to make fun of the antiseptic precautions of his confrere, but was in his own person as well as in his care of his instruments absolutely clean. After all, what is sterilization but scientific cleanliness? He who is clean in person, clothing, and instruments has given his patient a good chance for recovery—"A rose by any other name would smell just as sweet." Progressive surgery will continue to exercise due care, and he who knows how to do the best will reap the reward. Medicine has her Renans and Voltaires quite as much as religion, for both go on winning new laurels and increasing the armament of defence against the sneers of poticism.

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## A Table of Food Values.

| | Nourishment. | | Energy. |
|---|---|---|---|
| 1. | Cornmeal. | 1. | Cornmeal. |
| 2. | Wheat flour. | 2. | Wheat flour. |
| 3. | Oatmeal. | 3. | Oatmeal. |
| 4. | Salt cod. | 4. | Sugar. |
| 5. | Beef (neck). | 5. | Potatoes. |
| 6. | Cheese. | 6. | Salt pork. |
| 7. | Potatoes. | 7. | Wheatbread. |
| 8. | Wheatbread. | 8. | Cheese. |
| 9. | Chicken. | 9. | Butter. |
| 10. | Milk. | 10. | Beef (neck). |
| 11. | Eggs. | 11. | Milk. |
| 12. | Surloin. | 12. | Surloin. |
| 13. | Mutton. | 13. | Salt cod. |
| 14. | Salmon. | 14. | Mutton. |
| 15. | Oysters. | 15. | Eggs. |
| 16. | Salt pork. | 16. | Chicken. |
| | | 17. | Salmon. |
| | | 18. | Oysters. |

—W. O. ATWATER, in *The Forum.*

## Gastric Intestinal Affections.

Prof. Germain See (*La France Medicale*, No. 52, 1893) claims that a third of those patients who are thought to be dyspeptics from a stomachic affection are really suffering from an intestinal disease. This is especially true of women, and careful examination reveals no sign of any dilatation, for which they have been treated in vain for years, while the chemical tests are negative. These dyspeptics are not suffering from a gastric disease, for their whole trouble lies in the intestine. The large intestine is the seat of the disease, which deserves the name of muco-membranous enteritis. The small intestine, on the contrary, is in the same condition as the stomach. This muco-membranous enteritis is characterized by disturbances in the function of the colon, gaseous fermentation, dilatation of this viscus, but nothing reveals it with certainty except the passage of mucous, glairy, ribbon-shaped or cylindrical masses with the feces, often unperceived. These mucous products are also accompanied by the hardened residue of undigested food. Treatment consists in evacuating by mechanical means, as olive oil, senna, but not by purgation; calming the pains by the bromides of calcium, strontium or cannabis indica, not by opium. Limit the fermentation and the formation of gas and putrefaction by the phosphate, the salicylate or the biborate of soda in combination, not by benzonaphthol. The diet is that of a normal person, it being only restricted by the presence of habitual constipation or incidental diarrhœa. In general, hearty meat foods—ham, pork, game, calf, boiled eggs—are easily digested, while milk is difficult to tolerate. Potatoes, either mashed or boiled, as well as rice, are well borne, while fruits are of no advantage. Water and tea may be allowed, but no other beverages. Gaseous waters are not permissible on account of the presence of carbonic acid. Alcohol being absorbed in large quantities by the stomach, it is best left alone except temporarily, when digestion is bad. Then a hot sling may be drunken, but red or white wines are not permissible.

*The Cincinnati Lancet Clinic.*

## Woman's Health Protective Association.

At the recent Sanitary Convention at Harrisburg, a paper was read by the Director of Public Safety of Philadelphia, Mr. A. M. Beitler, in which he paid a handsome tribute to the recent public work of an organization, the Woman's Health Protective Association of Philadelphia, for the great interest they take in the city's cleanliness and for the success they have had in forwarding complaints to the proper bureau for registry. The Director of Public Safety believes that the women of Philadelphia, through this quite inexpensive organization, will yearly make their work tell on the city's good order and for the observance of sanitary regulations already provided; that they will be potent aids in preserving the health of Philadelphia. This city, by its plan, and its favorable building developments, of a single house to one family, should have the smallest death rate of any in the world, for in no large city are the bulk of the people so comfortably and decently housed. It only needs the education of the individual householder to do his or her part in every way, by vigilance and by voting, by setting an example both in personal care of premises and in reporting at once all nuisances in the neighborhood; an example, also, on the part of each voter in choosing loyal and business men to conduct the city's business in councils; it only needs this to have, in a few years, a transformed city, with clean water to drink, all places of pollution shown up and cleaned out, and not only the smallest death rate in the world but the most comfortable city to live in. All of this the women may bring about if they will be ceaselessly vigilant and fearlessly outspoken. *Journal American Medical Association.*

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## "Superfluous Spectacles."

KEOKUK, IOWA, FEB. 24, 1894.

*To the Editor:*—Superfluous spectacles are those prescribed by incompetent persons. Who are they? Surely not the educated physician who, after years of preparation, drops into ophthalmology by a sort of natural affinity; surely not the man or woman, who, when examining the eye, sees not only an optical apparatus but a living being behind it. No. The incompetents are those half-hatched and abortive products ground out by the so-called "ophthalmic colleges." These "colleges" are engaged in manufacturing opticians out of jewelers and oculists out of jays. Six weeks' time suffices in either case to produce a diploma-bearing individual, who goes forth to prey upon the credulity of the populace. These are the persons who are to blame for "superfluous spectacles."

Every educated physician engaged in ophthalmic practice knows that many cases of asthenopia, in which refractive error exists, are not cured by glasses. The glasses are blamed, the oculist denounced, and regular medicine is brought into disrepute, all because too much confidence has been placed in the curative power of the lenses. In these very cases, glasses are needed because of the existence of error. The fact that asthenopic symptoms are not relieved by lenses should not lead us to regard such lenses as "superfluous spectacles." Glasses will cure many strange symptoms—but they are not omnipotent. Often change of air, of occupation or the treatment of nasal disease; often the use of tonics and other constitutional treatment will be necessary. It is in such cases that the "eye oculist" of six weeks' preparation will fail.

What is the remedy? *Abolish the "Ophthalmic Colleges."* If they are valuable, why not establish rectal, genito-urinary, hepatic, stomachic and pancreatic colleges? Specialism in medicine has gone mad. James Moores Ball, M.D.

—*Journal American Medical Association*

# NOTICES.

## Illinois State Dental Society.

The thirtieth annual meeting of the Illinois State Dental Society will be held in the Senate Chamber, Springfield, Ill., May 8, 9, 10 and 11, 1894. An interesting program is in the course of preparation. Practitioners of Illinois and of adjoining States are cordially invited to attend.

Louis Ottofy, Secretary.

## Notice.—Alabama Dental Association.

DECATUR, ALA., JANUARY 15, 1894.

*Dear Doctor:*—Owing to the burning of one of the hotels in Troy, the Executive Committee of the Alabama Dental Association have decided that it is best to change the place of meeting from Troy to Montgomery. Meeting to be held from 10th to 13th of April, inclusive. Everything is being done to make it an interesting occasion. You are most earnestly requested to be present.

Yours fraternally,

S. W. FOSTER, Secretary.

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## American Medical Association.

The Association Train will leave Chicago Monday, May 28, via Santa Fe R. R., Denver & Western, and Southern Pacific, for San Francisco via Denver, Colorado Springs, Leadville, Manitou, Glenwood Springs, Salt Lake, Ogden, Truckee and Sacramento. Returning, after the meeting, the train will pass through Sacramento and Northern California to Portland, thence east by way of the Northern Pacific R. R. to St. Paul. A stop-over at Yellowstone National Park for those who desire it has been arranged, and it is understood that at several places on the journey there will be short stops. President Hibberd's party in a special car join the train at Chicago, and the St. Louis party are expected to join at Kansas City. From all points east and south, concentration on this train should be effected at Chicago and St. Louis.

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## The Transactions of the World's Columbian Dental Congress.

CHICAGO, FEB. 22, 1894.

The Transactions are now nearly ready for the final proofreading, it is therefore very desirable that those who want extra copies, and those who would like to subscribe for them do so at once, as it is the intention of the Committee of Publication to print only a sufficient number of copies to supply the members of the Congress and those who have subscribed for them. The subscription price is $10.00.

Subscriptions should be sent to Dr. John S. Marshall, Treas., 1003 Venetian Building, Chicago, Ill.

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# EDITORIAL.

## Care of the Mouth and Teeth.

In the consideration of this subject, both in writing and discussion, the chief attention is usually given to the teeth and the immediate tissues, and that too after they have become diseased. The matter of preventing disease does not usually receive the attention its importance demands.

The course of life and habit, that will secure in the highest possible degree a good state of health and prevent the occurrence of disease, is a subject that ought to be very thoroughly understood. The almost universal suggestion of those who speak or write upon this subject, to keep the teeth clean, is very good so far as it goes, indeed, this is an absolute requirement if the best health condition is to be maintained, but mere local attention, however thorough it may be, will come far short of securing the best results. Attention should be given to the secretions of the mouth, to the digestive organs, to the respiratory organs, and indeed to the condition of the entire system.

It is impossible to have a healthy mouth, with diseased digestive organs, or indeed with an impaired condition of any of the principal functions of the body; hence, general hygiene is a subject with which the dentist should be entirely familiar, but so rarely is a perfectly healthy mouth with a good set of teeth presented that the greater share of attention must be to those more or less impaired; and here attention to the general condition must be given as well, for restoration or even mitigation of disease in the mouth will depend very much upon the environment. Both local and general treatment will usually be required for the proper management of the diseases of the soft tissues of the mouth.

A very common fault with dentists is the failure to sufficiently emphasize to those they have in charge the importance of care, whether of cleanliness or general attention to health. A part once having been diseased, though the utmost may have been done for its reparation, is subsequently more liable to disease than before it was attacked. For instance, teeth that have been filled and are neglected are more subject to decay than before disease occurred; there are, of course, some exceptions to this rule; there may have been original defects in the teeth constituting vulnerable points for the attack of disease, but every one will recognize the fact that an attack of disease always irreparably weakens the organs, and it is rare that its original integrity can be restored. Under favorable circumstances repair in a large proportion of cases may be in a good degree effected. Not only should great care be bestowed upon repaired natural teeth, but assiduous and persistent attention should be given to all cases where artificial substitutes have been adopted, even the more simple varities of these, as, for example, a porcelain or gold crown must have intelligent and thorough care if it is to be kept in an acceptable condition; and more care, if possible, should be given to artificial teeth supplied by bridges or by plates.

In the construction of artificial teeth, whether one or many, one of the main points to which attention should be given is such an arrangement as will facilitate the utmost cleanliness and freedom from irritants. This is, if possible, of more importance where a number of natural teeth remain in the mouth. The usual condition attaching to artificial teeth, whether on bridges or plates, is one of impurity and of offense, depending usually to a degree upon faulty construction and adaptation, and too often with carelessness on the part of the patient. Such a condition is an offense not only to the patient but to his friends and those with whom he comes in contact as well. Doubtless, many a time, patients suffer from indigestion and defective nutrition, the respiratory apparatus also becoming involved, by the neglected and filthy condition allowed to exist in connection with artificial teeth.

The proper construction of artificial dentures for securing the best results in these particulars should have more attention in the future than it has in the past.

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In replying to an editorial note which appears in the February number of *The Pacific Coast Dentist*, we may say, when the Directory of State and Local Societies was first compiled it was supposed that the officers would, at least, take enough interest in those Societies to send notice of any change either in the election of officers or time of meeting; this, however, does not seem to be the case, as we find it necessary to write to some of the Corresponding Secretaries twice, and to a few even three times before receiving any reply. The pages of the DENTAL REGISTER are always open for the publication of any notices in connection with the Societies, either State or Local, that may be sent in. We are much obliged for the notice of the change in the names of the officers connected with *The San Francisco Dental Society*, though not made known in the usual way. The correction will appear in the April number.

## The Tri-State Dental Meeting.

At the last annual meeting of the Ohio State Dental Society a proposition was offered that in 1895, at some time to be agreed upon, the States of Indiana, Michigan and Ohio hold their annual meeting in joint session, at some place to be hereafter decided upon. The proposal met with general favor, and a committee was appointed to confer with the officers or a special committee of the State Societies of Indiana and Michigan with the view of making arrangements for such a meeting, especially if the proposition should be entertained as favorably by these two Societies as it was by Ohio.

Such a meeting would be of great interest and profit, would be one which, if properly arranged for, should bring together the leading members of the profession of the three States.

This simple mention is made of this matter in order that it may be in the minds of those interested. We hope to be able to speak more definitely about it within the next few months.

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## Bibliographical.

Popular Essays on the Care of the Teeth and Mouth, by Victor C. Bell, A B., D.D.S., Published by the Author. 1894.

This is a little work "prepared in the hope that it may in some way be used to spread a knowledge of the importance of the dental organs among the people, especially the young, through the medium of the schools, and through its teachings, if well followed, much of pain and suffering would be prevented and the general term of human life be perceptibly lengthened. It has not been written especially for dentists but chiefly for the public."

The work consists of twelve chapters and about one hundred pages. It discusses briefly and quite clearly, Cleanliness of the Teeth, Filling, Extraction, Artificial Teeth, Children's Teeth, Crown and Bridgework, Advice to Mothers, etc., in a way that cannot be otherwise than profitable to the general reader. To give information upon these subjects to the public has long been regarded by the profession as a very important matter. Were the people properly informed of the value of the teeth to the animal economy, and what can be done for their preservation, and be made sufficiently to appreciate them in all respects, there would be vastly less of disease of the mouth and teeth and loss of the latter than is now realized.

This work if it could be distributed to the public would certainly do much towards furthering a knowledge of and appreciation for the teeth. If it were possible to put it in a cheaper form, so that it could be purchased by dentists and distributed to their patients, its influence would be far more widespread. There have been quite a number of productions of this kind prepared and distributed, and doubtless each has had its influence. But while such works are desirable and may accomplish much good, yet they cannot take the place of the instruction which the well equipped dentist can give personally to his patients. The ability to do this ought to be cultivated by every student preparing himself for dental practice.

Dr. Bell will doubtless have the thanks of the profession for this book, and we would heartily commend it to every dentist for use in his reception room.

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## Dentistry in Court.

For about two years and a half a case has been upon the records of the courts of Detroit in which C. H. Land, of Detroit, was plaintiff, and J. Taft, of Cincinnati, defendant. This is a case in which it was alleged by the plaintiff that the defendant had used to sundry persons language very derogatory and injurious to the reputation of the plaintiff.

This case was brought to trial on Friday, January 19, 1894. A large share of the evidence by the prosecution was given by the plaintiff, and consisted mainly in describing and explaining what he had accomplished in the way of new and improved appliances for use in dental practice. Evidence covering but a very few minutes was given by two witnesses who said they heard the defendant make the statements charged in this case.

The defendant had no knowledge of ever having made the statements as alleged in the charge. Prominent members of the profession of Detroit were called to the witness stand, and stated that the plaintiff had made many devices and alleged improvements in dentistry, but there seemed to be upon the part of each one a disapproval of some business methods practiced by Dr. Land, especially his methods of advertising, which they seemed to regard as altogether unprofessional.

After the evidence was completed the attorneys occupied from two to three hours in the discussion of the case before the jury; after which the jury went out for deliberation.

After some two hours or more they returned saying they could not agree; upon which they were dismissed by the court. After which it was learned that the jury stood as follows: Five for the plaintiff and seven for the defendant.

Thus the case rests at the present.

THE DENTAL REGISTER.

VOL. XLVIII.] APRIL, 1894. [No. 4.

# COMMUNICATIONS.

## Diseases of the Maxillary Bones and their Periosteum.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

BY VIDA A. LATHAM, F.R.M.S., D.D.S , CHICAGO, ILL.

Under this heading we will notice some points of interest connected with dental surgery and pathology, although the cause and history of these diseases are so numerous that it will be almost impossible to do more than briefly allude to some of the most common forms met with by dental surgeons, every one of whom ought to have such a knowledge of the affections of the oral cavity that they might, with some degree of certainty, determine what the causes are, their pathology, diagnosis, and their treatment. Especially should we know the morbid growths which can occur, whether benign or malignant, so that we may early diagnose the case, and if we do not care to take such cases for treatment, to warn our patient to consult a surgeon.

Unhappily, the question as to whether dentistry is a specialty of medicine still exists. Even such a man as Prof. Norman W. Kingsley says in the *Medical Record*, Nov. 20, 1886: "Oral surgery, even in its most comprehensive sense, is not dentistry, any more than dentistry in its most comprehensive sense is not oral surgery." But whether it is or not, every one is well aware that one department can not do without the other, and the more we can learn of all the sciences the better professional men and women shall we become. The position of dentistry as a specialty of general surgery is justified to a greater degree than in the case of any other specialty. "Surgery," as defined by one of our surgeons, "is that branch of the healing art which takes charge of all those diseases and injuries which require in their treatment the use of instruments and mechanical appliances, operations or especial manual dexterity." To no other specialty does this definition so aptly apply as to our own, and with reference to general surgery as a specialty of medical science, we know that a specialty should be the outgrowth of a liberal professional education—in short, that a specialist should be a man who "knows something of everything and everything of something."

The standard of a profession is raised or lowered by the character and work of its representatives. It rests entirely with them whether they will assert and maintain their claims to their true position, or allow the public to estimate them as it pleases. Better times, however, are coming, better men coming to the front, better thinkers and workers are banding themselves together, resolved to show that dentistry is not beneath, even if it is not above, the medical profession, but that it is a large and distinct branch of medical science requiring not only the same studies but its own special ones as well, and must be recognized and honored as such.

Medical men know too little dentistry, and the dentist too little of general medicine, to be able to examine thoroughly these diseases of the jaws and to treat them as is necessary, seeing that they depend for cure on the attention given by both professions. We, of all people, should know thoroughly the healthy normal appearance of the oral cavity, all it contains, and should therefore be immediately able to detect any pathologic condition. Cultivate thoroughness as early as possible; make a methodical examination, beginning at one tooth, say the left superior third molar, and continue around the arch, and then do the same with the inferior maxilla. Note the condition of the mucous membrane, which shows much of the condition of the roots of the teeth; the tongue, which indicates the state of the alimentary canal; the secretions of the mouth, which aid us in telling the nature of the calcific deposits upon the teeth, and whether the sensitiveness is due to acidity; and then note the color of the lips, and finally the general condition of the patients themselves. If any abnormality be present, examine for the cause with every care, then decide on the treatment and remedy, noting at the same time the idiosyncrasy of the patient. Many of these affections dentists are called upon to treat, and others, after they are diagnosed, we should hand over to the care of the physician. With these cases, whether simple or serious, we should be well acquainted, as we are more likely to see them in their early stages, and by immediate interference we may warn our patient and thus induce him to obtain medical or surgical attention, and thereby save him from long and serious, yes, and often fatal illness.

We are all aware of the difficulty in diagnosing oral tumors. For example, in epithelioma it is far better to urge early surgical interference than to wait until extension by the lymphatics places the patient beyond help. Hence make an early diagnosis; examine every sore, ulcer and spot in the mouth, using every precaution in antisepsis for the benefit of the patient and yourself.

For the reason that the diseases of the jaws are not often discussed, I have ventured to write a few notes on them, to try to show that they bear the same relation to dentistry as do the diseases of the gums. It is a matter of some difficulty to decide how to classify the subject. Perhaps the easiest way will be to discuss first the periosteum and its diseases, and then the close relation it bears to the bone itself will explain how the latter becomes affected.

The alveolo-dental membrane intervenes between the tooth and the bony socket or alveolus It was formerly supposed to consist of two layers, but the idea has been abandoned since it has been demonstrated that fibers could be traced continuously from the bone to the cementum. The membrane, periosteum or ligament, as it is variously called, consists of connective tissue, between the bundles of which run groups of vessels and nerves, but it contains only a few yellow elastic fibers and therefore can not be stretched much. It is, however, necessary that the tooth should be capable of some degree of movement in its alveolus, for every temporary inflammation by increasing, for the time being, the blood supply of the part, causes the partial extrusion of the tooth, which is so well known to patients as being "longer than the rest." How, then, if we have so few elastic fibers, is movement of the tooth, without tearing the unyielding membrane, rendered possible, unless it be by a special disposition of the fibers? The bony attachment of each band of fibers is nearer the neck than the cemental portion of the tooth, and may be looked upon as suspending the tooth in the alveolus by fasciculi of the periosteum, rather than as resting upon the membrane, and therefore some play is allowed, as the tooth can be raised or lowered until the cemental fibers are visible or lost to view beneath the gum. The fibers are continuous, but there is a slight difference between the portion nearest the bone and that nearest the cementum. At the former place the fibers are larger, while at the latter they become a fine net-work and more cellular. Again, age affects the tissue, for specimens show it to be thinner, especially the cemental portion, but it is not entirely obliterated. The periosteal blood supply is very complex, being derived from the *pulp-artery branching off just before it enters the foramen, and the terminal filaments anastomosing with the arteries that supply the gums. Just at the rim of the alveolus there is a rich plexus formed by union with the arteries of the periosteum and gums, the "gingival plexus," and near the cement there is a capillary plexus. "The blood vessels are most numerous midway between the bone and cementum, or rather nearer the latter." (Tomes.) Thus we may conclude that the teeth have three sources of nourishment, viz.: through the pulp, and through the peridental membrane in its two sources.

The exact nature of the membrane is still far from being satisfactorily explained. Malassez (*Journal British Dental Association*, 1885, p. 484) says "it is a ligament, for these reasons: *a*, if true periosteum existed in such a situation, mastication would be a very painful process, owing to the abundance of nerves; *b*, microscopically the tissue is more ligamentous than periosteal in structure; *c*, mastication produces traction, not pressure; *d*, the attachment to the bone and cementum is precisely like a tendinous insertion ; *e*, the distribution of the vessels and nerves in the interstices between bundles of fibers suggests ligament and not periosteum." Ranvier and Kolliker take a similar stand regarding its structure. And yet we know it is true that the membrane is directly continuous with the periosteum covering the rest of the maxilla; that the shock of mastication can be borne on periosteum, as, for instance, in edentulous ridges of the jaw-bone; and again it is certainly not quite a typical ligament, but a typical periosteum, with a specially modified function.

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*"The Blood Supply of Teeth," Dr. Hunt, in Dental Review.

The alveolar walls develop at the same time as the root. Proceeding from the base of the follicle is a line of cells, the formative point of cementum, and another line, the formative organ of the alveolar walls; one develops down to form the socket, the other forms the cementum, the two layers being continuous. Whether the membrane is single or double is a question. Analogy from anatomy, etc., would make us think the true membrane would be in two layers. Demonstration proves it, for on extraction, the root of a tooth is covered by a membrane and the alveolus is lined with a membrane. The alveolar lining is from the bone, and so it must be referred to the osseous system. The formative organ of the cement, can it be the same as that which forms the alveolar walls? Some say it can not, and yet the cementum is like true bone except for the perfection of the Haversian canal, and the lacunæ are irregular in shape, size and distribution. The canaliculi are more numerous from the periosteal side of the lacunæ, fewer run inward toward the dentinal surface, and they contain the remains of the formative "osteoblasts" as we find in bone. The cementum contains "fibers of Sharpey," developed from the formative periosteum, which are calcified bundles of fibrous tissue like those in bone, and therefore why can we not call the cementum a modified bone? Tomes says the cemental organ and that which forms the alveolar walls are not the same; they are closely united but distinct and separable, the external formed from connective tissue with blood vessels, the inner a layer of cells. Dr. Ingersoll says he saw some of Dr. Black's specimens, and one of them was perfect in showing the histologic difference of the two layers. None of the straight lines of the peridental membrane were found in the alveolar membrane. If the membrane is double, two sources of vascular and mineral supply would be expected, from the pulp and from the sub-mucous tissues. Pathology aids us by revealing the difference in exostosis and hypercementosis. Irritation follows the blood vessels, and under the influence of irritants the root may take on an abnormal action; this is one form of exostosis, which latter term should be properly named either ex- or hypercementosis. If the nerves and blood-vessels follow the course of the membrane, and it is not double, why are not both layers affected? Why do we not have both true exostosis or enlargement of the socket and also hypercementosis or enlargement of the roots, consequently tooth-ankylosis? When two roots are exostosed they grow together by impingement, but never the alveolus and root, hence there is no osseous union. Yet again, how often do we find periodontitis go on to periostitis, one being usually primary to the other? Would this not imply they were connected, if inflammation can so readily pass on from one to another? The conclusions I have arrived at by reading and specimens are:

1. The periosteum and the peridental membrane are identical. I prefer the term, periosteum.

2. It is divided into two layers, internal and external, or osteo-genetic and fibrous; the internal, or osteo-genetic, forms the alveolar layer, and the external, or fibrous, forms the cemental layer.

3. The alveolar and cemental membranes are not identical.

4. The two layers have different functions; one forming and lining the alveolus, the other surrounding and holding the root.

5. The cement appears to be developed from the periosteum, and not from the dentine or odontoblast cells, as under the microscope it has the same appearance as bone, except that the lacunæ and canaliculi are not so perfectly developed.

When cementum is required to be very thick, as in herbivorous animals, where it is destined to cover the whole tooth, Magitot says, it first becomes the seat of a formation of hyaline cartilage, which ossifies like any other bone developed after the intracartilaginous method. Where it is to be thin and only cover the crown, as Nasmyth's membrane, it is the seat of ordinary intramembranous ossification.

6. Pathology shows the same fact; there is no union between the root and the alveolus.

7. The rapid mineral absorption of the root without exfoliation is due to the special nature of the cemental membrane as distinct from the membrane of the socket, and has been microscopically proved.

8. It is a great deal better to consider the peridental membrane as periosteum divided into two layers.

| | | |
|---|---|---|
| Periosteum | External (fibrous) layer, continued as the cemental layer.......... .............. | peridental. |
| | Internal (osteo-genetic) layer, continued as the alveolar layer ...... . .... | membrane. |

The structure: white, fibrous tissue, cells, blood vessels, nerves, little elastic tissue and no fat. Thicker at the neck than at the root. Fibers of periosteum run downward and inward to the root, so the more pressure on the tooth the more tense the fibers. Structurally, there is one common periosteum for tooth and alveolus, the fibers at the cemental surface being looser than near the bone. The fibers attached to the bone are arranged into bundles; thus some parts are seen to be denser than others. In the reticular or cemental fibers, cells or osteoblasts are seen and also at the bone surface. Corpuscles are also dotted all throughout the periosteum. The fibers of the periosteum at the neck blend with the fibrous tissue of the gum, and with the periosteum of the alveolar border. Pulpitis leads to periodontitis or periostitis by free communication from vessels of the gum.

[*To be Continued.*]

## Trional.

Keppers, in a thesis read this summer at Wurzburg, draws the following conclusions from his experience of trional: It is a rapid hypnotic, especially useful in mental excitement. The headache which occasionally follows on its use quickly disappears. Thirty grains is a full dose. Disorders of the digestion seldom follow its use. Cardiac troubles contra-indicate its use. The anhidrotic action of the chemical is very marked; 3 to 4 grains arrest profuse perspiration. T. W. H.

*The Cincinnati Lancet-Clinic.*

# Enemies of the Human Teeth.

BY A. M. BENSON, M.D., D.D.S., LA CROSSE, WIS.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

In the same mail with Dr. Talbot's letter of invitation to prepare a paper for this meeting, came a circular from a member of our profession announcing that he had discovered a new local anesthetic, making the extraction of teeth harmless and painless, the greater part of it being devoted to testimonials from doctors and dentists who had used it, and telling how they had removed from six to twenty teeth from the mouth of one person at a time, thereby very much increasing their business, the author closing with urgent advice to all dentists to avail themselves of this great boon offered to the profession at the very low price of one dollar a bottle or six for five dollars. During the past year I have received perhaps half a dozen similar advertisements, and nearly all of them signed by a D.D.S. Many of you have had no doubt a like experience.

Chagrined at this impudence and unprofessional proceeding, and believing that such practice ought not to go uncondemned and under professional protection, I have accepted the invitation, and the enemies I wish to direct your attention to are not those about which so much has been written, which it takes a scientist with a microscope to discover, and against whom the evidence is mostly circumstantial, but those conspicuous and more dangerous ones whom we have all seen with the naked eye, and many of us felt upon our naked jaw; who plume themselves with professional titles and dwell mostly in "dental parlors," though they are sometimes found in the country doctor's office; who shed innocent blood and mutilate the human body in the guise of saviors, and claim special social recognition and honor; who write articles for the journals and are often found in college faculties, where they are conspicuous for their zeal in elevating the standard of the profession; whose interesting portraits so often confront us in the advertising columns of the public press along with the rest of the medicine humbugs.

Perhaps some one murmurs: This is a slander. Let me relate what I witnessed in one of the high-grade schools:

A local dentist, not a member of the faculty, was invited to give a clinique for the benefit of the class, the operation to be the extracting of a number of teeth under an anesthetic, ether being the one administered. The victim, an ignorant servant girl, whose mouth was indeed in great need of renovation, affording the students a splendid opportunity to take a lesson in the highest achievement of the dentist, "the restoration to usefulness of diseased teeth." But what was done under the direction of the professor? The frightened girl was placed in the chair, pulled into the recumbent position, and the inhaler placed over her face, against all of which she frantically struggled, but the odds being against her, she finally succumbed. Then began a scene worthy of a place in the Spanish Inquisition, and which properly described and illustrated would form a fitting canto in Dante's "Hell." The chief operator, after removing his coat and cuffs, seized a forceps and with trembling hand thrust it into the spongy gums as near a tooth and collection of tartar as his shaky condition would permit. Successive quick jerks, accompanied by the sounds of crushing bones and low groans, followed by a swaying among the pressing crowd, trying to dodge flying pieces of haggled humanity, continued for some time, when, owing to exhaustion of the operator or the overflowing of blood and ingesta which threatened to strangle the patient, active operations were for a moment suspended; but there still remaining some roots deep in the gaping wounds of her jaws, others present knowing themselves experts volunteered to kindly assist the tired scientist and cover themselves with blood and glory. The former was easily accomplished, but the opportunities for glory seemed wanting, and after bringing away a few chunks of gum and process, they retired, declaring those were the most obstinate roots they had ever encountered. The patient having again collapsed, a sympathetic looker-on, realizing if this poor creature should any longer serve the ends of science she must die, suggested that the clinique cease for the present, and the remaining roots be removed at a future time, when the gums were not so swollen. The hour, too, now having passed, the class, evidently satisfied that their alma mater had provided them a fine clinique, hurried away to the amphitheater to listen to a lecture on remote disorders in the body caused by carious teeth, leaving the patient to the care of the janitors, who, considering her from the human rather than scientific standpoint, kindly cared for her until she was somewhat restored, and some hours later, though still dazed and bleeding, conducted her out from this woeful place.

I have never been able to conceive of any excuse for such an outrage within a dental college. As evidence that such teaching bears abundant fruit in practice, I quote, verbatim, articles from a popular dental journal, the first headed: "A Large Tooth."

"About a month ago a lady from our town introduced herself to me with the intention of having some teeth extracted to make room for an artificial set. I removed eight of them with great difficulty, though I had administered first a soothing preparation invented by me for this purpose. A few days ago the lady returned to have the remaining teeth removed. In examining the mouth, I found a perfectly sound upper cuspid on the right side, and I advised her to let it remain. The lady, however, insisted on having it removed, in doing which I succeeded, after two unsuccessful attempts, with safety forceps. The tooth is one and one-eighth inches long, and shows a circumference of one inch. The lady weighs at the present time 110 pounds. Has any one extracted a larger tooth? We should like to compare notes."

In the next issue appeared the following answers:

"About five years ago I was practicing in the town of ——. One day a cadaverous-looking man came into my office to have several teeth extracted. After removing two or three, I tackled the right upper cuspid, and after some little difficulty it gave way. I thought I had pulled the whole jaw off, for a large piece of process and the first bicuspid came with it. The bicuspid is one and seven-sixteenth inches long and one and one-sixteenth inches in circumference."

"Last June I extracted seven superior teeth for a lady. I found four very difficult to remove, viz: two canines and two first bicuspids. One canine is one and five-sixteenth inches long and fifteen-sixteenths of an inch in circumference. The bicuspids were bayonet-shaped. One is one and one-sixteenth inches long and one inch in circumference. The lady weighs about one hundred and twenty pounds."

"About three weeks ago I extracted six teeth for a lady, among which were two upper cuspids, both largely decayed. The larger of the two measured one inch and five-sixteenths in length and almost one inch in circumference. The smaller is one and a quarter inches long by fifteen-sixteenths of an inch in circumference. I preserved these monsters and have them in my possession."

I avoid names, as my desire is not to point out individual shortcomings, but to direct attention to a too common practice. I believe the venerable Dr. Holmes is credited with saying, that if all the drugs used as medicine had been sunk in the bottom of the sea, it would have been better for humanity in general. I think the same might be said, if not of the entire dental profession up to date, at least of all the instruments invented for the extraction of teeth.

I venture the statement that at the present time, though in the vanguard of the profession are many noble men who can truly be called dental doctors, a large number of so-called dentists are truly "enemies of the human teeth," destroying more than they save.

I knew a dentist, now deceased, who during the twenty-five years he was in practice extracted, it is safe to say, enough teeth to fill an old-fashioned farm cart. Imagine for a moment, what this represents in blood, tears and trepidation, to say nothing of the leering deformity, crippled condition, and many deaths directly due to this malpractice. The best men in the profession are agreed that 99 out of 100 of all the teeth and roots presented for treatment can be saved and made comparatively useful, and with less pain to the patient.

It has also been demonstrated by implantation—though I hope this operation will not become popular—that teeth long out of the mouth and strangers to the new organism can be accepted and become firmly held in the jaw; then how much better must it be to retain roots which have the advantage of natural position and long-established attachment. This being true, what shall we say of those who extract sound teeth to make room for an artificial set, or because some people ignorantly desire it?

As mentioned in the beginning of my paper, this has all been said before, and the majority of dentists have a vague idea that it is wrong. Then why is it? I think the chief reason may be given in one word, "Business."

O, Business! what crimes are committed in thy name!

The public has so long been educated by the quack in all the departments of life, that it is easy for men without moral character, but possessed of some cunning, to get money by preying upon them. Every day thousands of people freely give hard-earned money to have teeth extracted which should be saved, and thousands of dentists daily serve them, conscious of the wrong, simply because they want the money. Alas, that cash should be so dear and flesh and blood so cheap!

A dealer in dental materials informed me that one manufactory of artificial teeth sent out 5,000,000 sets each year, and there are a number of such enterprises in our country whose prosperity depends mostly upon the efforts of those dentists who extract teeth to make room for their products. Unfortunately this weakness for money does not belong to the dental specialty alone. If from all the learned professions were taken those who practice for revenue only, the number in each would probably be very much diminished.

Theoretically, this is an age of high ideals, but practically we have something yet to reach; and though I have called attention to evils common in our profession, and am convinced that for many of us it were well to examine ourselves if we are worthy the title we bear, yet I believe that our specialty has made greater progress than any other department of medical science, having accomplished the successful treatment of nearly all the diseases of the mouth, and making the preservation of teeth in the hands of the intelligent and conscientious dentist a certainty. In my opinion what is needed is not so much higher knowledge, but a better use of that already possessed.

While at college I was often edified with encouraging lectures by members of the faculty who never failed to inform us that there was plenty of room at the top of the ladder, seldom mentioning that there was anything needful or honorable to do at the bottom.

This may be well, but I have discovered in practice that if the glory of the dentist be the salvation of the natural teeth, for the dentist true to the noblest impulses of his nature who values the approval of his own better judgment above all things, and will succeed by honorable means or else retire, there is an extensive field for labor at the bottom of our professional ladder. Probably less than one-fourth of our population take proper care of their teeth.

I have thought that if, as in the clerical profession, we had different degrees or orders in our specialty, so that the ambitious youth who now seeks admission to the college, but owing to its high requirements fails to enter; for such there might be a sort of preparatory department where, if bringing evidence of having learned their catechism (especially our duty to our neighbor) they might be admitted and instructed in that branch of our work which does not necessarily require an extensive knowledge in science and literature, but rather mechanical skill, which having learned, they might be ordained and licensed like *Fourier's Sacred Band*, to do such duties as are distasteful and likely to be neglected by the D.D.S.—missionaries, as it were, to a benighted public, who now under the flickering gasoline light sit and allow these devils who go up and down our country, seeking whom they may devour, to scatter their teeth about the public market-places while the band plays "Annie Rooney"—saving them from this quack and his brethren, the vitalized-air and local-anesthetic fiends, by teaching the use of the tooth-brush and the saving power of amalgam filling, and after thus having served humanity for some time, and honestly earned some money by only asking the same fee for saving teeth as is now willingly paid for destroying them, might take a further course at college.

Three hundred years before Christ, Erasistratus, a dentist of ancient Greece, is said to have deposited in the temple of the Delphine Apollo, a leaden tooth-forceps, to impress upon all beholders that only those teeth should be extracted which could be removed with such an instrument. Might not, in our day, such an emblem be profitably suspended in every church and public school-house, or at least in every medical college and dental office?

But let me bring this paper to an end, confessing that its only redeeming feature is the object for which it was written, and if it shall be the means of saving a single tooth which otherwise would have been destroyed, I shall believe it was not written in vain.

Dr. Edgar Palmer said that the indiscriminate use of these secret compounds for local anesthesia should be absolutely and sternly discountenanced. He had never used any such. He had very carefully and rarely used a formula which had been recommended to him by one he could trust. He knew of cases where septicemia had been caused by hypodermic injections of such a preparation by one who was exhibiting it for advertising purposes, causing one death and severe trouble to several.

Dr. Taft said that every dentist should stamp his disapproval on everything which is brought out as a nostrum, and never lose an opportunity to warn people of the dangers of the traveling quack who goes from town to town, and either from the gaudy chariot or in the "dental parlor" extracts teeth without pain. The danger of operating on one patient right after another, using the same syringe and the same forceps is so serious that if it were understood their occupation would be gone. Besides the danger of infection, is the necessity of having the nostrum strong enough to be effective in every case; this means that for those who would be easily influenced it is dangerously strong. People should be intelligent enough to know that they should not sacrifice teeth except when they can not be saved, and that one whose business is only to extract is not working for the good of the patients, but of his own pocket. The profession should set its face as a flint against such practices, and treat such operators as the Irishman treated the crowd in the fight, " whenever you see a head, hit it," and crush it if possible.

Dr. S. Saxe spoke of a man who came to his town, and, with a grand flourish of advertisements, announced himself as a famous dentist, and agreed to extract all teeth painlessly, and to refund the money unless he did so. The quack referred to, who really was a graduate and sported the D.D.S. after his name, pocketed over $300 a week, while the conscientious dentists in the town were helpless to hinder the harm he did. The only way the dentists can stop such disastrous proceedings is to educate the people as to the value of the natural teeth, and the means necessary to preserve their usefulness.

Dr. Brown said he knew of one of these painless-extracting fiends, who, having guaranteed to extract with absolutely no pain, had been sued for damages by several sufferers upon whom the anesthetic had not had the desired effect, and he had had to pay the damages and seek new fields for practice.

Dr. Edgar Palmer said, on account of his position in the State Society, he always heard of these cases as soon as they advertised, and that he had taken pains to discover that this man was a graduate of the University of Pennsylvania. Upon learning this, he had written to Dr. Darby, sending him a copy of the advertisement. Dr. Darby had replied that he had communicated with the fellow, and would let him know what he said when he received his reply.

Dr. Taft said we can not hold the institution which graduates a man responsible for his future acts, and after a man has graduated the institution can exercise very little control over him. In some States the law will take hold, but in most States we can do nothing.

Dr. Benson thought that in cities the boards of health should prevent such practices. The ignorant public should be protected from the loss of their teeth, which loss will surely result in danger or injury to their future health.

Dr. V. A. Latham thought that the diploma should contain an agreement that advertising or other grossly unprofessional conduct would work a revocation of the diploma. This was the case in Great Britain, where a dentist who had received a diploma from any of the institutions which issued them, and who should be convicted of unprofessional conduct, would have his diploma annulled, his name stricken from the register, and would be fined or imprisoned should he describe himself as dentist, or use the initials of his degree after his name.

## Practical Oral Therapeutics.

BY GEO. V. BROWN, M.D., DULUTH, MINN.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

Genius has been defined by Carlyle as "an immense capacity for taking trouble," and the methods of oral therapeutics require genius in just that sense for their administration.

Having in charge the natural gateway of the whole wonderfully complex system of human mechanism, we are familiar through experience and the frequent statements in medical and dental literature, with the fact that inflammations having their exciting irritation in the mouth often cause by reflex action severe neuralgic pain in the eye, ear, different parts of the head, face and neck, or whenever connection can be found through the many ramifications of the fifth nerve and its ganglionic associates, that in the same manner also sometimes originate diseased conditions of a very serious nature in the eye and ear, as well as spasmodic affections of the muscles, lockjaw, convulsions, epileptic attacks, paralysis, nervousness and indigestion, and that too there are in contra-distinction to these another class to which belong the infectious diseases of the oral cavity itself, and those that are caused by the migration of pathogenic micro-organisms from the mouth to other parts of the body.

Miller, in his "Micro-organisms of the Human Mouth," considers the diseases caused by the pathogenic bacteria of the mouth under six heads according to the point of entrance of the infection, and it is this classification which I shall follow in discussing their treatment:

1. Infections caused by a breach in the continuity of the mucous membrane by mechanical injuries (wounds).

2. Infections through the medium of gangrenous tooth pulps and from alveolar abscess.

3. Disturbances conditioned by the resorption of poisonous waste products formed by bacteria.

4. Pulmonary diseases caused by the inspiration of particles of slime, small pieces of tartar, etc., containing bacteria.

5. Excessive fermentative processes, and other complaints of the digestive tract, caused by the continued swallowing of microbes and their poisonous products.

6. Infections of the intact soft tissues of the oral and pharyngeal cavities whose power of resistance has been impaired by debilitating diseases, mechanical irritation, etc., considering in this connection also the possibilities of infection by the accumulation in the mouth of the excitants of diphtheria, typho-syphilis and diseases of like nature.

Of the affections not caused by pathogenic bacteria, by far the greater number are the result of an inflammation of the tooth pulp, discussion of the treatment of which in all the variety of opinions so frequently brought forward by the enthusiastic adherents of each, would, of course, be quite beyond the possibilities of this paper. Therefore, I will simply state that in this opinion, while fully recognizing the important value of the pulp in a healthy condition, once having been irritated by exposure to external influences and afterward covered by a capping, it must always afterward be looked upon as a source of danger and a menace to the associated parts, unless the circumstances be so favorable that success is assured.

By the careful destruction and removal of the contents of the pulp chamber and canals, the thorough cleansing with antiseptic measures, and the filling of the roots with gutta-percha, inflammations of this character may be promptly and efficiently relieved. Once the exciting cause has been discovered and removed, usually nothing further is necessary in this class of inflammatory processes unless it might be the use of an astringent, a counter-irritant, or better still where practicable, the lance.

In taking up the treatment of diseases caused by pathogenic bacteria of the oral cavity, a rapid glance at the possibilities in this direction seems to be demanded.

The toxic properties of the human saliva have been noticed by observers since the earliest times, and the experiments of modern biologists have fully borne out the truth of their reports.

Fatal results, attendant upon the bite of persons, and the death of animals injected with human saliva, for the purpose of experimentation, have been explained, as we all know, by the transmission into the circulation of the omnipresent pathogenic bacteria, finding as they do in the mouth, a home easy of access, and possessing all of the little conveniences in suitable temperature, moisture and proper nourishment that go to make the microbe's lot a happy one.

Of primary importance, then, must be the care of our hands and instruments. Fatal septicemia, pyemia, and the transmission of syphilis through accidental wounding of the mouth with infected instruments are too well understood to need more than a passing reference here.

In my own practice it is my custom to keep a small jar of $\frac{1}{1000}$ preparation of bichlorid of mercury upon the operating table, and I have given myself the habit of dipping my mouth mirror and every instrument that I use into it before putting it into the mouth. One has the comfortable feeling that an instrument subject to the corroding influence of bichlorid, and then wiped so thoroughly that it does not corrode is at least mechanically cleaned, even if the action of the germicide might be questionable in so short a period of time.

In using instruments upon the soft tissues and upon the bony structures, I take the additional precaution of an open flame, because even if there be damage to the temper of the instrument it does not seriously unfit it for use in this manner.

The care of the necks of the teeth and that most obstinate affection at the gingival margin known under the various names of *pyorrhea alveolaris*, *Rigg's disease*, *phagedenic pericementitis* etc., on through a variety of different appellations, each, however, signifying a chronic suppurative inflammation of the periosteum accompanied by an inflamed condition of the gums, and more or less affection of the alveolar process.

Undoubtedly there are constitutional predisposing conditions which are largely responsible for the frequency and obstinacy of this trouble, but there seems to be such a diversity of opinion and so many different constitutional disorders are given as predisposing causes that we are forced to the conclusion that the subject is but little understood; for instance, some writers put it in the category of bone diseases, others ascribe its cause to wasting diseases, while rheumatism, gout, scrofula, malaria, tuberculosis, rachitis, and a host of others have each been brought forward as the cause. Some investigators claim to have proven it to be the result of a specific bacterium, and to have separated pure cultures, which in turn would produce a similar affection in animals, from which again pure cultures of the same bacteria were obtained; but biologists do not agree upon this point, notably, Miller, who has been unable to get the same result with his experiments and who questions the correctness of others' claims in this direction; therefore, in view of its doubtful origin, we can only be safe in recommending for general treatment any constitutional defect that may be present, as a precautionary measure, and then applying ourselves to the local sources of irritation.

Tartar about the necks of the teeth is the first step; then a careful following down of the denuded portions of the roots, and as thorough a cleaning as possible of the rough little deposits of sanguinary calculus nearly always present.

This is a matter of great difficulty, and its failure is probably the most common cause of recurrence of the disease.

Many instruments have been devised for the purpose, but none that I have used has given me such thorough satisfaction as small excavators ground flat. They can be prepared in a moment with a corundum disk in the engine, so that we have always at hand a scaler so small that it can be passed along the side of the root to the very end of the pocket with the least possible pain and laceration of the gum, besides being so sharp that the slightest sensation of roughness would be recognized by the fingers of the operator in a manner that would not be possible with a less delicate instrument.

In the application of local remedies three properties are necessary, antiseptic, acid and astringent.

Antiseptic because bacteria are always present, and to dissolve the particles of lime salts that may have and always do escape the mechanical cleansing; astringent, to reduce the inflammation and constrict the relaxed gum tissues. Hydrogen peroxid is a valuable wash for the purpose of syringing out the pockets; it destroys the pus, and at the same time acts upon the limy deposits in a most cleansing manner, by reason no doubt of the hydrochloric acid, which the preparations on the market have been found to contain. Dilute sulphuric acid, the aromatic preparation of sulphuric acid, the essential oils, and other remedies of a like nature are recommended. Pyrozone is also very highly spoken of.

Unfortunately, my supply of rabbits and guinea pigs has been somewhat limited, and I have therefore been obliged to confine my experiments to the pig in a higher state of development, according to the idea of the comparative anatomist.

During the last four years, since my residence in Duluth, a great deal of this trouble has come under my care for treatment, either because it is of a catarrhal nature, and the situation at the head of Lake Superior is particularly favorable to its development as to all catarrhal affections, or because having been constantly looking for it, more cases have come to my notice; but whatever the reason, it has appeared in every stage of development, apparently in much larger proportion than in my practice in other localities. The conclusions which I have to offer are therefore of an entirely practical nature.

First, in regard to its so-called incurability by reason of its relation to so-called constitutional causes.

My most obstinate cases have been almost invariably persons of robust stature, in whom apparently all of the predisposing constitutional affections were wanting, whose teeth gave little trouble from caries, every indication pointing to good structural development, and a healthful general condition.

A typical illustration of this class is a patient who came under my care in January, 1889, age 44 years; temperament a combination of bilious and sanguine; well-developed chest, good circulation, good digestion, regular habits, a vigorous, active business man; never had been seriously ill in his life, no catarrh of nose or throat, no rheumatic tendency, no skin disease, nor did a history of his case develop that any of his family had ever been, to his knowledge, affected by rheumatism, syphilis, scrofula, rachitis, or tuberculosis; and a most thorough examination of his urine failed to showed any normal condition pointing to Bright's disease or anything of that nature. Constitutional search abandoned, the examination of the arch gave but little better promise; the teeth were large with perfectly-developed crowns, each as nearly in its proper position as possible, the occlusion of the jaws correct, except where the affected teeth had elongated as a result of the disease; not a carious tooth among the number; all in place except the left superior third molar that had fallen a first victim to the disease; there was some accumulation of tartar, and its usual accompaniment of other deposits; the buccal roots of the right superior second molar were denuded their entire length. A loose flap of gum remained upon the buccal side of the first molar, but examination showed that the pus-filled pockets extended almost to the end of the root. The gums about the necks of the other teeth showed more or less pus upon pressure.

Treatment was continued at regular intervals for a period of two years, an antiseptic mouth wash prescribed and used regularly one or more times each day; the pulp canals of the two molars were cleaned and filled, for the continued formation of pus had finally reached the ends of the roots and destroyed the connection there; the pockets and necks of the teeth syringed with antiseptics, the loose gum removed by use of the lance and by absorption, until both molars had buccal roots denuded.

The first sign of improvement was a cessation of the discharge from about the necks of all the other teeth, and finally it was checked about the molars, and all around the edge of the gum at the line next to the affected molar roots there appeared what seemed to be a line of brighter colored new granulations.

I still see the patient every five or six months, and he continues the use of the wash, but apparently there is no return of the pyorrhea.

We have, all of us, had many such cases, and I have only gone into detail at the risk of wearying you, because it particularly illustrated some points I desire to call attention to.

We have seen that all ordinary methods of discovering constitutional predisposition failed, and the fact that the case yielded finally to local treatment would seem to indicate the cause as a local one. We know that the contagion theory is not borne out by the transmission by contact from one person to another, for if it were, undoubtedly husbands and wives would both be affected commonly instead of very seldom as reported, and yet, notwithstanding all this, I have under my care the two daughters of this patient, aged respectively twelve and fourteen years; they have each had quite severe inflammation of the gums, and quite recently I cleansed a pus-filled pocket at the neck and palatal root of a first molar in the mouth of the younger one.

Pyorrhea can undoubtedly be held in check and with continued proper care be prevented from reappearing, but whether or no it can be entirely cured, as is claimed by many, is a question not easily answered, because once severely attacked, even though the discharge be stopped, the parts never again regain that normal condition which should make them impervious to their destructive surroundings, and it is certainly a questionable difference whether a recurrence of the trouble be from the original infection or a fresh one; therefore, I hold that just so far as a condition of self-cleansing surfaces can be restored, in that proportion only can the cure be estimated; to this end, therefore, I recommend (notwithstanding instruction from high sources to save the gum margins) the removal of loose flaps of gum covering the pockets for I do not believe that they can ever be made to attach themselves to the separated surfaces again, and must of necessity afford a lodgment for infectional influences.

The loose teeth should be banded to firm ones, and the irritation of their movement in the sockets thus removed; also the occluding surfaces ground down until the excessive strain due to elongation be obviated.

The one final injunction before passing the subject, is to urge the importance of going to meet this trouble—not waiting until the pus-filled pockets are thrust upon us. Part of my regular examination is a pressure of my finger upon the gums inside and out all around the mouth, and it has been a matter of surprise to me how many of the apparently-unaffected cases showed that light-colored exudation, not pus but its almost certain forerunner.

This is the stage at which pyorrhea may certainly be cured, and to use a little Hibernian mode of expression, the best time to cure it is before it has begun.

In taking up the subject of infections from gangrenous tooth pulps and alveolar abscess, one is confronted by a most appalling array of dangerous possibilities; however, as the subject of this paper was suggested to my mind by a point raised in conversation with a prominent physician, I will quote his remark and then discuss from that standpoint. He said: "I believe in saving teeth and all that sort of thing, but it seems to me that dentists are too anxious to save teeth, and put on crowns to preserve roots that afterward cause serious trouble and are an injury to health instead of a benefit."

The undeniable force of this statement as generally applied struck me, and a perusal of medical literature showed, in almost every instance, wherever the general practitioner entered upon a discussion of diseases associated with the teeth the same idea governed his reference to the treatment of the mouth.

My answer to the above was a messenger next day, who brought the doctor in to see abscessed teeth treated, and some carious bone removed. I think he left convinced that correct surgical principles were applied in the mouth as elsewhere, and now, my answer to general writers is the bringing forward of well-known methods here urging their general distribution, that our best efforts may not be so often impeded by the suffering endured, and the serious complications that so frequently ensue before the dental practitioner is finally sought for relief.

Miller speaks quite bitterly of the custom of many physicians in disregarding dental diseases altogether as a factor in pathology, and says "it is as unjust to their patients as it is discreditable to their profession," but I do not agree with censure of the physician; the fault lies with dentists, and there is where the spur should be applied.

A gangrenous tooth pulp may be removed, the tooth canals disinfected by thorough drying with hot air or a heated wire and the use of antiseptics, preferably one that is not a coagulant (I use oil of cassia) and the danger of further infection removed, but when an apical abscess has formed, the destruction of the pus sac and the removal of the surrounding alveolar process as well become necessary.

An incision through the gum, followed by free use of a bur in the dental engine, quite readily effects the removal of the diseased tissues, then by enlarging the opening through the end of the root from the inside, medicaments injected into the opening in the crown can be freely forced through the end of the roots, and forced out through the gum, thus washing the entire affected surface perfectly clean.

A tooth thus treated is almost if not quite as fully under control as if it were extracted and in the hands of the operator, so far as cleaning it is concerned, and if the roots be immediately filled the wounded surface will heal up as readily as a simple cut.

Even the most chronic cases that have resisted other methods for years will yield to this treatment, provided, however, there be enough of the periosteum alive, but, of course, the destructive processes sometimes include also the entire surface of the periosteum, and the root being entirely dead, nature will not tolerate it, and her efforts to get rid of its annoyance will be continued.

A few fragments of necrosed bone are all that was left of that portion of the superior maxilla on the right side, extending from the central incisor to the tubercle, including the floor and part of the outer wall of the antrum, as well as part of the palatal process from the mouth of a young woman who suffered some three weeks before I saw her.

Removal of the necrosed bone, and the teeth in that region with it, the application of the engine and a large bur over all the roughened edges, washing with peroxid of hydrogen, oil of cassia and equal parts of peroxid and bichlorid of mercury 1-1000 gave almost immediate relief. A tonic was prescribed (for a slight formation of pus upon one of her thumbs gave reason to fear, as did also her color, that there was danger of pyemia), and also an antiseptic mouth wash, with instructions to use the latter freely. A rapid healing of the parts followed.

For three months a poor unfortunate was kept in one of our hospitals with a fracture of the lower maxilla that refused to unite. When he came to me there were three fistulous openings in his neck just below the angle of the jaw, into which the Sister of Charity packed cotton in masses as large around as my finger.

The fracture had occurred by reason of a blow from some heavy instrument—the man had been slugged and robbed—and search proved at the same time the pulp of a lower molar had been destroyed. Its removal, together with a portion of necrosed bone, syringing as in the last case, and in a few days the patient was discharged as cured.

Of very common occurrence is the infection of the maxillary sinus from apical abscess.

Many cases of so-called catarrh of the nose, throat and ear passages have had their orgin from this cause, and have been cured by treatment from the mouth in the following manner, viz: removal of the source of infection by extraction, or treatment of the tooth, and a free opening made through the floor of outer wall of the sinus, as low down as possible, to give better drainage and to allow therapeutic cleansing by forcing medicaments out through the communicating opening into the nose, and with the head thrown back let them run down the throat until they thus reach almost every portion of the exposed surface of the mucous membrane.

I believe it will soon be considered the correct method to open into and treat through the sinus every case of chronic catarrh of the nose.

The same lining membrane must and does transmit the infection to the antrum; the offensive secretions thus formed are held as in a pocket, where the usual treatment through the nasal passages can not reach them; what more natural, then, than the treatment described above?

No need to cite cases from practice of diseased antrum, we have all had too many of them, but I have given great relief in a number of instances where no purulent suppurative condition of the antrum was present, simply by the direct effect upon nasal catarrh that seemed to be otherwise incurable. One of my patients recently came to me in an extreme state of exhaustion, the constant presence in his throat and stomach of the discharges from his nose had prevented his eating or sleeping for some days and nights; relief was immediate, in fact, while he was still in the chair; and he made a business of eating and sleeping for some days afterward to make up (as he said) for lost time.

Peroxid of hydrogen I use until the passage into the nose is opened up, and after it a strong solution of salt and water is quite sufficient and very safe. Thorough drainage, however, is the most important step.

Syphilitic necrosis and lesions of the soft parts of the mouth require in addition to the surgical and antiseptic local treatment, the internal administration of iodid of potassium and mercuric bichlorid, for which, together with a proper general treatment, I always recommend them to the physician, knowing full well that we can each of us do better for the assistance of the other.

The presence of bacteria in such great variety and number in the mouth at all times must be looked upon as a menace, not only to the teeth in their relation to dental caries, but through their action as well upon the mucous membrane, in rendering it more susceptible to the germs of specific diseases, fevers, etc., upon the digestive tract, for many complaints of the stomach and intestines have been found to be caused by mouth bacteria and their waste products. Even the lungs are subject to this influence from the mouth, therefore its thorough disinfection becomes at once a matter of first importance.

Recognizing this fact, Miller, Black and others have prepared most carefully comparative statements of the strength of the various antiseptics used.

Miller particularly, has demonstrated that the rapid use of the ordinary antiseptic wash, unless accompanied by thorough cleansing is of comparatively little benefit, because at least several minutes are necessary to sterilize particles of food lodged between the teeth.

He recommends the following formula as one having the most rapid action:

| | | |
|---|---|---|
| ℞ | Acid thymic | .25 grams. |
| | Acid benzoic | 3. grams. |
| | Hydrargium bichlorid | .80 grams. |
| | Tinct. eucalyptus | 15. grams. |
| | Alcohol absolute | 100. grams. |
| | Oilgaultheria | qt. xxv. |

Mix.

Black's one, two, three mixture is:

| | | |
|---|---|---|
| ℞ | Acid carbolic | i. |
| | Oil cassia | ii. |
| | Oil wintergreen | iii. |

The wash that I have for some time past given to my patients is:

℞ Listerin.
Glycerin.
Acid carbolic.

Mix. Sig.: Dilute one-half teaspoonful in one-third glass of water, brush on the teeth and gums; hold in mouth and use on silk between teeth at night.

I give instructions to use full strength on the silk; in cleansing the mouth to hold it, and continue its use for several minutes consecutively.

This wash and the manner of using it has given my patients great satisfaction, not only as a means of checking tendency to caries, but also in fevers, such as typhoid, by relieving the unpleasant accumulations of mucus, and I believe has exerted an influence toward obviating the deteriorated condition of teeth, which almost invariably follows this class of diseases.

A physician who had noted its effect upon one of his patients got the prescription from me, and now uses it regularly in his practice.

The day is fast approaching when the treatment of the oral cavity will be a battle with therapeutic remedies rather than one of mere mechanical skill, and if I have seemed to give undue emphasis or wearied you with too careful note of little things, let me excuse myself with the honest statement that nothing in my professional experience has given me so much encouragement, so lifted me above the daily grind of bread-winning, or made me feel the great possibilities that are before us so keenly, as the bringing to light of some hidden source of trouble that perhaps for years had caused pain and distress, and being the instrument for its relief, and this can only be accomplished by looking for the little signs that have escaped notice by reason of their deceiving insignificance.

Surely 'tis an honest payment upon the indebtedness of our creation, and after all makes life seem worth the living.

Dr. Edgar Palmer spoke of a new tooth powder recommended to him by a physician for morbid conditions of the mouth, such as spongy conditions of the gums and fungous growths. The powder was quinine, and Dr. Palmer asked those present if they thought there was anything in it.

Dr. Talbot said there were three distinct conditions which were called pyorrhea alveolaris, and properly so-called, too, as each was shown by the flow of the pus from the alveolaris. The first was Riggs' disease, which results from deposition of tartar upon the teeth below the margin of the gums. The second is the condition described by Dr Ingersoll, characterized by the deposit of sanguinary or serumal tartar, and the third, of which variety I have cases at present, is a disease of the gums only, with no particle of deposit. I wish to bring out the necessity for systemic treatment for these cases. Unless the condition is good the disease will not be cured, and if the general system after the cure of the local disease is attacked by gouty, rheumatic or renal trouble the condition of the teeth will return.

We, as dentists, do not pay the attention to the mouths of our patients, which we should. It should be the rule to always examine thoroughly every mouth in which we have to do anything, and treat and clean it, putting it in a thoroughly healthy condition. This is a very important part of our work and we should get paid for it; otherwise we can not afford to do it. When a patient comes to me, where pockets are observed along the margin of the gums, I remove the tartar from the teeth and saturate the gums with clear tincture of iodine. After the second day, I thoroughly overhaul the mouth and proceed with the treatment as recommended by the essayist. If, however, the teeth are loose, I can not treat successfully, except by removing the teeth. With the teeth extracted, it is a simple matter to heal up the gums and keep them in a healthy condition.

Dr. A. M. Benson asked how the iodine healed the gums?

Dr. Talbot said he did not know how, but knew that it did. He said that it was generally known that iodine would reduce tumors and swellings in all tissues, but we do not know how it acts.

Dr. Benson thought that if the tooth and gums were freed from all foreign substances the healing would come without medication.

Dr. Talbot said that in cases where there was no tartar on the teeth it was often possible to cure by systemic treatment, and spoke of cases in his own practice which he had successfully treated by building up the system, omitting all local treatment.

Dr. W. A. Gudex said that Riggs' disease was perhaps the most puzzling and least promising of the troubles which dentists were called upon to treat. It might be described as an ulcerative pericementitis; sometimes the result of mechanical irritation, sometimes he thought the result of lead poisoning. He had noticed it in painters who had suffered from lead poisoning. He could not boast of much success in treating it. The only radical treatment was to remove the tooth or teeth affected.

Dr. J. Taft said that the treatment of diseased gums was very difficult, but he thought the treatment pointed out in the paper was suitable for a majority of cases. In many cases the general system is in such a state that it is impossible to cure the local disease without systemic treatment; the system must be toned up. In other cases the general condition is so hopelessly poor and defective that it can not be brought up to a state in which there would be hope of success. In such cases the only thing to do is to extract. Then there are cases where the general system is so good, is so well nourished, and has such recuperative power that if the irritant be removed the part will be restored. Remove all necrotic tissues either by an instrument, or by an escharotic, or by some other remedy such as iodine or pepsin; these seem to break down the necrotic substance and to stimulate the circulation which carries off the broken down, useless tissue. It is necessary to remove everything which will be an injury or an irritant. Simply pressing the finger on the part several times a day will be beneficial, as the pressure drives the blood away, and upon relieving the pressure there is an influx of new blood and an increased circulation which will help to carry off the diseased matter.

Robinson's remedy acts well as an escharotic, and if used as directed will prove efficacious in a large majority of cases. A dentist should always know just what effect he should expect from every remedy he uses, and why he uses the particular substance to effect the purpose.

Dr. Vida A. Latham spoke of the structure of the peridental membrane, and said that it had never been properly described. She denied that there was such a membrane, but said that it was the same as the periosteum, and that there was no reason just because it ran over the root of the tooth that its name should be changed. The descriptions in the text-books of this membrane vary; some say that it is an elastic membrane and others describe it as a ligament; she thought it showed careless writing in the books when they varied so. She thought a good name for pyorrhea alveolaris would be osteo-periostitis, meaning an inflammation of the bone and tissues surrounding the bone. These affections do not differ from similar inflammations in other parts of the body. Whenever found they are very hard to treat, as they usually occur in persons of poor organization, whose vital force is low and recuperative power almost nothing. In such cases the very structure of the bone is poor.

Dr. G. V. I. Brown said that his purpose in describing the case in his paper was to bring out discussion, as the case was one of perfect physical health, and he also wished to call the attention of the members of the Section to the fact that the daughter of the patient was troubled with the same disease, showing or appearing to show, that heredity was a factor in some cases.

# Reforms.

BY SIGEL ROUSH, A.M., M.D., D.D.S.

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When a young man receives his degree he immediately sets about to work great reforms in his chosen field of labor. He feels he has no time to lose, but must act promptly and with decision. He discerns grave and menacing defects and appalling errors that threaten his profession with complete annihilation. He feels he is destined to perform a great work and is impatient for the fray. He usually inaugurates this reformatory measure by addressing to the leading organ of his profession an exhaustive and verbose treatise, in which he learnedly reprobates existing evils, freely gives much-needed advice, and urges with the ardor and ignorance of a parvenue his gigantic and idealizing schemes. The young divine fresh from the seminary suggests ways and means by which the world may be rapidly transformed into a veritable millennium; the beardless but confident young disciple of ÆSCULAPIUS would dazzle the world by the brilliancy of his reforms in the healing art; the young legal limb would put Blackstone to shame by his wonderful forensic achievements and his original interpretations and applications of law; and the full-fledged "knight of the masticatory organs" beholds, but for his timely advice, the noble art of dentistry sink into odium and degradation. Your writer belongs to the last-named profession. He has been dubbed "D.D.S.," and is, consequently, prepared to inform the hoary-headed members of his fraternity how to conduct themselves in a manner that will redound to the glory and honor of dentistry.

To begin at the beginning, dentists, like poets, are born not made. The boy who would rather spend his Sundays in his father's workshop, where he has some mechanical apparatus in course of construction, than go to Sunday-school will make a better dentist than the young prodigy who had read all of Dickens and could repeat half of Shakespeare before he had reached the age of twelve.

Most dentists, I believe, resent the term "mechanic" or "mechanical" when applied to their profession, and yet, in the opinion of your writer, it would be easier for the proverbial camel to pass through the eye of a needle than for a dentist to attain any considerable measure of success unless he possessed, in a marked degree, mechanical skill of the finest quality. In nine out of every ten cases that come to a dentist's office, mechanical skill alone is all that is necessary to proficient and professional work. Why should the charge then that we are mechanics so ruffle us when it is the highest recommendation we can possess to guarantee valuable services? Who would not prefer to be a first-class mechanic to a third-class member of a profession? 'Tis true, a knowledge of anatomy, pathology, hygiene and therapeutics in operative and surgical dentistry, and of the properties and uses of the material employed in prosthetic dentistry, is, of course, necessary; but with this knowledge alone the would-be dentist is a decided failure, and when I see an awkward, blundering student, without even a suggestion of mechanical skill or ingenuity in his composition, but who has chosen dentistry for his life work because he knows Dr. So-and-So makes from three to seven thousand dollars a year in dental practice, my heart goes out in sincerest pity for him. He will grow to hate his profession, and after having failed to subsist upon his income and lost years of his valuable time he may realize his mistake, and finally find work for which he possesses some natural ability. Without love for and interest in his chosen work, success in the highest and noblest sense can never be obtained.

America is the home of dentistry, and American dental colleges are the best in the world, but even here some reforms might be instituted with salutary effect on the profession. Many colleges have short and incomplete courses. The faculties not paid at all or receive meagre compensation for their services, and only accept their chairs for the honor (?) of sitting on the stage at commencements and designating their positions on their letter-heads and business-cards. They occupy their chairs from selfish and mercenary motives, and, consequently, get through their course of lectures with as much ease and as little inconvenience to themselves as possible. The demonstrators in charge of the operating room and laboratory are either men with no practice, on account of youth and inexperience or on account of age and last century ideas. The infirmaries are often poorly equipped, and about all the average student learns in such a school is to make a monstrosity in the way of a rubber plate, and put in a half creditable amalgam filling. When he comes out of college, therefore, he is totally ignorant of modern, progressive dentistry. These same professors under whose proficient (?) and conscientious (?) services these students are graduated now organize private post-graduate courses and solicit matriculants. The new graduate is not long in realizing that his college course has been a farce, and that he is totally unprepared to practice intelligently modern dentistry, and joins these private classes where he sometimes learns for a liberal fee what should have been taught him for his college tuition.

Infirmaries, again, are often made money-making institutions. "Free dentistry, except cost of material, under the direction of skillful operators" is advertised, and by using material furnished at a nominal price by houses anxious to introduce their goods, and by careless and rapid work, and by admitting indiscriminately all who apply, the daily net earnings of an ordinarily well-patronized infirmary are often more than those realized from an average office practice. The writer has known the children of wealthy parents to come to the infirmary to have their teeth filled. On inquiry in one of these cases, it was learned that the child, a girl of fifteen, had been instructed to go to the family dentist and have him do all the work that was necessary in order to put her teeth in first-class order. She was supplied with sufficient money to pay her bill. The girl, however, had an eye to business and went instead to the infirmary, where she had her work done, and after paying her bill she pocketed about ten dollars extra money, which she explained would take her to the matinee at least ten times with a little left for candy. In another case the writer saw a well-dressed lady drive up to the infirmary door, instruct her coachman to return in an hour, enter the college, and have her teeth fixed. Her husband owned valuable property and was well-to-do.

Admission to the infirmaries should be regulated, and no work should be done for any one who is able to pay regular prices. If blanks were placed in the hands of the various charitable organizations of our cities with instructions to fill in the names of any charity patients who were in need of dental services, and then only admit patients who held these cards, it is the opinion of your writer that the infirmaries would have sufficient material without robbing the reputable dentists of their rightful patients. Dental associations and other fake organizations have undoubtedly injured legitimate practice. Every city has its cheap advertising dentists. Plates are made for from three to eight dollars. As a result, plate-work especially has suffered a falling off. Many well-to-do and intelligent people will give themselves credit for five or ten dollars and take their chances in getting a satisfactory plate of these cheap dentists. Is there a remedy to this menace to legitimate prices? It is a difficult question with which to deal. The operators are, as a rule, graduates from reputable colleges, and are consequently legally entitled to practice. Perhaps regular dentists are more or less responsible for this state of affairs. In the first place, dental societies are not made sufficiently attractive to induce new practitioners to join. In some cases the fees are an object. The older dentists take little or no interest in the new members. Many established dentists are selfish and mercenary, and instead of welcoming young members into their ranks resort to every means to starve them out. If they have work to throw into the hands of other dentists they prefer to give it to an older member—one who is on a living basis and who is hopelessly established. Our professors *at commencement* welcome us to the profession in the most unselfish and fraternal words, and take every opportunity to keep us out of practice. Happily, there are exceptions to this rule.

Finally, the young dentist becomes soured and discouraged. He can't live on ethics, and having already learned that he will receive no help from the established dentists of his city he adopts advertising and cheap work, and so-called reputable dentists are fte n responsible for the course he has chosen.

Again, we lack organization and harmony. Unless we stand as a body we will never be able to maintain scheduled prices. Our societies often don't include half the practicing dentists of the place. Lack of interest has made them unattractive. Let us build up and increase the membership of our organizations. Give the new members, a chance. Appoint them on commitees and let them read papers. Throw enough work into their hands to keep them on their feet, and your writer believes we will have fewer to desert, or rather we will have driven fewer members into the ranks of charlatans and quacks.

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## Therapeutics of Aconite and Iodine in Pericementitis.

BY W. I. JONES, D.D.S., COLUMBUS.

Read before the Ohio State Dental Society, December, 1893.

Excepting toothache resulting from irritation of the pulp, there is no other pathological condition of the teeth so common, and at the same time so distressing, as inflammation of the peridental membrane, and whether it is caused by mechanical violence, poisonous infection, or by some chemical irritant, it is, in either case, unless arrested, as far-reaching in its results and as difficult of treatment, consequently for the cure of this lesion, many remedies have been advised. Among the *drugs* used are aconite and iodine; the first is a sedative to the nervous system, and when applied locally checks inflammation by paralyzing the nerves of the part and reduces the force of the circulation. It has been called the "*Therapeutic Lancet*" and, Potter says, rightly used, is one of the most valuable drugs we possess. Iodine is alterative, stimulant and tonic, promotes absorption of the products of inflammation and has been used for the cure of pleuritic effusion, ascites, hydrocele, ovarian dropsy and chronic abscesses. It acts especially as an excitant of the glandular and absorbent systems. Thus we see that one arrests further development of inflammation while the other diffuses the fluids already accumulated. The ways of administering are two: by placing in simple contact with the mucous membrane, and by hypodermic injection into the tissues over the affected teeth. The enepidermic method is, no doubt, universally employed. But the hypodermic administration is probably not practiced as widely as pericementitis is experienced. And because it has proved so effective in my own experience, am persuaded that it possesses advantages that the enepidermic does not. The dose is from three to four drops of tincture of aconite and iodine in equal parts injected into the loose tissue near the upper border of the alveolus. To insure the best result the point of the needle must be quickly passed beneath the mucous membrane and the contents of the syringe delivered slowly so as not to rupture the tissues. When done accordingly the operation becomes a very simple one. You have only to rightly manipulate the syringe and the drug is exactly where it is needed; is quickly absorbed; does not cause vesication and affords almost immediate relief. Such happy effects I have not obtained by any other remedy, and it is thus, only when the aconite and iodine are hypodermically administered.

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In discussion of the above, Dr. W. H. Sedgwick says:

The peridental membrane being so abundantly supplied with vitality is frequently subjected to inflammation, and I know of no disease presented to the dental practitioner that is so annoying and perplexing as the one under consideration.

The peridental membrane is an elastic, velvet-like cushion, entirely lining the alveolar cavity of each root of the tooth. It has just enough of elasticity to allow the tooth a slight movement in any direction, when it resumes its normal position as the pressure is removed. This peculiar membrane is supplied with blood vessels and nerves, as is the pulp of the tooth at the apical foramen just before entering the pulp canal, these vessels separate and a branch continues along the side of each root, or fang, of the tooth, supplying the pericemental membrane. By the aid of this membrane we are enabled to distinguish the touch of the tooth, and Prof. Black, says "this is the only organ of touch possessed by the tooth, and this is so delicate that the least pressure of the tongue conveys the sensation to the tooth." By means of this delicate membrane we are enabled to distinguish this disease (pericementitis) from pulpitis and other diseases of the tooth that come to our notice—percussion producing pain and flinching, which is not the case in pulpitis.

Inflammation of the peridental membrane is ushered in and distinguished by redness of the gums, heat, pain and tumefaction or swelling. In diseases of this membrane we are in a measure confined to local applications to the gums—after removing the cause of disturbance, and here let me state that all inflammations are caused by an irritant; in pericementitis the irritant may be a putrescent pulp—may be from a blow, or some irritant around the gingival border of the alveolus—salivary calculus, for instance; and I have seen considerable inflammation of the membrane by the overlapping of an amalgam filling—probably inserted by myself—impinging on the peridental membrane at the neck of the tooth. Now before any therapeutic treatment will avail much, the cause of the irritation must be removed.

The treatment most relied on for pericementitis has been counter-irritation and stimulating the absorbents. Aconite and iodine have been largely depended on for this purpose, and I have always used the aconite and chloroform as a local application, applied by means of a napkin, at frequent intervals, followed by painting the gums with iodine; the iodine seems to be more readily absorbed and carried to the place where most needed, when the chloroform and aconite is first used; aconite paralyzes the sensory nerves, arterial tension is lessened, the inflammatory process being thus held in check until resolution ensues. Iodine acts also as a counter-irritant and excites the absorbents, thus whipping up these little scavengers, enabling them to carry off any effete matter accumulating in any local part of the body and diffusing it through the system; it has been extensively used in inflammation of the peridental membrane and of the gum tissue.

But, it may be inquired, "how are these external remedies brought to bear upon deep-seated and internal inflammations?" I answer that the beneficent author of our existence formed us so that there exists an intimate relation, a close sympathy, between internal parts and the external surface immediately opposite or over them, and physicians have all along availed themselves of its advantages in treatment of internal or deep-seated diseases. This treatment, to be effective, may have to be repeated for several days to secure control of the conditions. In my own practice I have found, in addition to the local applications, great benefit in administering aconite in one to two drop doses every hour for six or eight hours; or in the use of gelseminum in five drop doses. These are great depressors of the heart's action and should not be administered by ignorant or careless practitioners.

Dr. Jones, in his paper, has directed the attention of the profession to a new and novel method of applying these remedies to the seat of disease in pericementitis. Never having tried the hypodermic injection of iodine and aconite, I cannot speak advisedly of the practical value of this manner of using these remedies; but, theoretically, it seems to me to be applying the medicine exactly where needed, as the lymphatics will carry the remedy immediately to the parts diseased. The only criticism I would make is the dose of aconite; three or four drops injected into the loose tissues is a large dose, especially for some constitutions, and would have to be carefully watched; the use of iodine, hypodermically, would necessitate a new needle for almost every application.

But Dr. Jones' method certainly has its merits, and I hope will be tried by other members of the profession and reported on for the general good. I would add that Dr. Jones, in applying these remedies, dilutes them.

## Infection from the Mouth.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

BY E. L. CLIFFORD, D.D.S., CHICAGO.

Each and every day brings the thoughtful student more and more to face the fact that the scientific world is progressing; and he who has kept *au courant* with the literature of medicine must acknowledge that the results of such investigations as are now being pursued have, for a principal object, the unfolding of the prime factors in the causation of diseases, with a view to their prevention.

Recent investigators have sought to open up new fields; they have tried, and found wanting, in many instances, the beaten track, and their efforts tend to the opening of new lines and a practical departure from the pathology of the past, with an ever increasing tendency to lead us to cultivate and entertain broader, or at any rate less narrow views, as to the elements which play an important part as etiologic factors in the causation and origin of diseases.

It is not necessary, or even advisable at this time, to recapitulate the theories of the past, and our aim will have been attained if we can take a few profitable glimpses at the newer fields, allowing the lines of thought and inquiry which may suggest themselves to each to furnish a basis for intelligent discussion.

Much has certainly been accomplished in the last two decades in the field of etiologic pathology, still much remains to be done, and upon the shoulders of some of the bright lights in our specialty and this Section will certainly fall a part of that task.

Investigation and experimentation in the past have been unable to specify and establish any *single* thing as a final cause of disease; and it has been said by one, eminent in our current literature, that he knew of no disease which acknowledged a *single* cause. Our work, then, if this be true, must be to search for and find out the many and ever varying factors or conditions which, as antecedents, combine to produce disease; and I am of the opinion that to the physiologic agencies within our bodies during life we will find many competent factors.

The researches and expositions of Gautier, Peter, Brown and Brunton, confirm our belief in the poisoning or intoxication of the animal economy with its own products. These eminent physiologic chemists traced and pursued their investigations from two general aspects, and Aitken in his excellent review of their work has classified them under two heads: 1, from a chemic and physiologic, or bio-chemic standpoint; and 2, from a clinical or pathologic. From the first standpoint the fact was established that in dead animal tissues, processes of putrefactive decompositions set in, by which certain alkaloids are elaborated from the proteid substances, and these alkaloids were designated by the late Selmi, of Bologna, as "ptomaines." Gautier, however, further showed that in the *living* animal tissues, and that by virtue of their vitality, certain other alkaloids are elaborated, which are analogous to the ptomaines, and these he has named "leucomaines." But, still further, in addition to these facts, he has demonstrated that in the living animal economy there are elaborated certain azotized uncrystallizable substances which are as yet undetermined, and which he has called "extractives" or "extractive matters," and which Aitken states are quite as unknown as the x, y, z's of an algebraic formula.

The nature of these extractives, then, remains a mystery, but this much we are told of them: that while we are assured that the ptomaines are toxic and that the leucomaines are also toxic, these unknown extractives are more toxic or poisonous to the system than either. Different alkaloids have been obtained from different sources, both animal and vegetable, and as long ago as 1820, Kerner pointed out the resemblance between the symptoms of poisoning by the animal and vegetable alkaloids. Experimentation since has confirmed the theory. "Zuelzer and Sonnenschein obtained, both from macerated dead bodies and from putrid meat infusions, small quantities of a crystallizable substance which exhibited the reactions of an alkaloid, and had a physiologic reaction like atropin, dilating the pupil, paralyzing the muscular fibers of the intestines and increasing the rapidity of the pulse." V. Anrep obtained an alkaloid from poisonous fish, and Vaughan an alkaloid from poisonous cheese, but Gautier, Etard, Brieger and others have given precision to the data previously acquired, and added largely to the varied and careful examinations of cadaveric tissues;" "they forced the conclusion that during putrefaction of nitrogenous animal material there are formed organic bases, fixed or volatile, presenting for their chemic and physiologic properties, the closest similitude to the vegetable alkaloids."

In fact, while it was at first supposed that these animal alkaloids differed in their nature from the organic alkaloids formed by vegetables, and various reactions had been given to distinguish them, Brieger appears to show that the distinction can be maintained no longer; but that the animal and the vegetable alkaloids are similar in their chemic constitution; that they are both products of albuminous proteid decompositions, and that some, at least, of the so-called ptomaines are identical with vegetable alkaloids. Hence, Dr. Brunton seems justified in regarding alkaloids "as products of albuminous decomposition, whether their albuminous precursor be contained in the cells of plants and altered during the process of growth, or whether the albuminous substances undergo decomposition outside or inside the animal body, or by processes of digestion, as by organized ferments." Aitken also states that it has been shown that the alkaloidal products formed by the putrefaction of albuminous substances vary according to the stage of decay at which they are produced. At first, the poisonous action of the ptomaines may be slight; but as decomposition advances the poisons become more virulent, while after a still longer period they become more broken up and lose to a greater extent their poisonous power. (Brunton.)

"In addition to these alkaloids obtained by Brieger, a number of poisons have been got by other workers from decomposing articles of food, or from dead bodies, and even from portions of healthy animal bodies, and although these may not have been obtained in the same state of purity, may not have had their chemic constituents so well defined as Brieger's, they are still as unknown extractives, x, y, z's of great interest and importance."

Experimentation has even shown that the primary products of albuminous decomposition of digestive ferments, such as peptones, are poisonous; and that pepsin will split up albuminous substances still further; and Dr. Brunton very aptly sounds the tocsin of caution against the extreme and indiscriminate use of various digestive ferments, and of the many varied artificially digested foods which have now become common. Consequently, it behooves us to study the products of albuminous decompositions as a matter of much practical importance, not only as regards pathology, but as regards therapeutics. Now it would not be possible to exclude these animal alkaloids from the general economy, for Gautier has proven that they are a necessary product of *vital physiologic processes.* His experiments show "that about four-fifths of our disassimilations are the result of transformations within the body, comparable to the oxidation of alcohol, and that the remaining one-fifth of the disassimilations are formed at the expense of the living tissues themselves, free of all demands on foreign oxygen." In other words, "a fifth part of our tissues live after the manner of ferments, that is they are anerobious or putrefactive as to their life." "Hence the possibility of alkaloids being thus formed within the living organism, independent of bacterial fermentation is quite within our conception."

Bio-chemically, the same author states that much has been proved, and he does not doubt that poisonous alkaloids are continuously formed in healthy men and animals by the decomposition of albumen in the intestinal canal, during the process of digestion, or in the blood and tissues generally by the metabolism which occurs during the functional activities of life. He believes that a considerable production of alkaloids takes place in the intestines, both when the digestive processes are normal, and more especially when they are disordered. Were all the alkaloids to remain within the body, poisoning would undoubtedly ensue, and Bouchard makes the statement that the alkaloids formed in the intestines of a healthy man in twenty-four hours would be sufficient to kill him if they were all absorbed and secretion stopped. Another statement, made by the same author, tends to show the power of these agents as an etiologic factor, and which at this time will probably not be questioned: "That the nervous disturbance which occurs in cases of dyspepsia is due to poisoning by ptomaines;" "that they augment notably in the course of certain maladies—in typhoid fever for instance."

[*To be Continued.*]

If the intermarriage of disease was considered in the same light as the intermarriage of poverty, the hereditary transmission of disease, the basis of so much misery in the world, would soon be at an end.

# SELECTIONS.

## The Mind and the Weather.

Says Sidney Smith, "very high and very low temperatures establish all human sympathy and relations. It is impossible to feel affection above 78° or below 20° Fahr." Morality is undoubtedly influenced by the state of the thermometer. In India, Hill states 48 per cent. of crimes of violence disappear during cold weather. Lemon, in a recent short article (*Am. Jour. of Psychology*, Jan., 1894), again calls attention to the relation of the weather to psychic states. Among other interesting things he says:

"Certain tendencies are repressed and counter-influences set at work or made dormant. A sudden rise of temperature predisposes those liable to an attack of mania. Some patients are so sensitive to, and dependent on the weather, that they anticipate the thermometer and barometer. One sign of growing neurotic diathesis is inability to keep at the top of one's condition and in good tone in unusual weather. On suicides the effects of the weather are well known. The interesting little book of weather proverbs, published by the weather bureau, is a psychological treasure house upon all this subject.

"Nearly all vocations—some, of course, more than others—are affected by weather. Men of science are often as much subject to weather as seamen. Some writers must have the weather fit the mood, character, or scene, and can do nothing if they are at variance. An adverse temperature brings them to a dead halt. If one will but read poetry attentively, he will be surprised to find how much of it bears weather marks, scattered all through it. A popular writer thinks weather often affects logic, and that many men's most syllogistic conclusions are varied by heat and cold. Diverse weather states may be one cause of so much diversity and even disagreement in thought processes, usually regarded as scientific. I have collected opinions of many experienced teachers, and nearly all think there should be modification of both school work and discipline to correspond with weather. Animals respond to it promptly and with no restraint, and almost constitute a sort of weather signal service if observed. Ancient prognostics were based here. Dunwoody, *e. g.*, gives lists of animals which become restless before rain.

"The fact, that now our property as well as our comfort depend on the weather, has given weather a new power as an excitant which dwellings and clothing had lessened. Man should be joyful or depressed, optimistic or pessimistic over other things than this. The anxiety expressed by the directors of the World's Fair concerning the state of the weather of the opening day was a strain which suggested suffering. Some have said that a certain very famous criminal was acquitted last August solely because the stifling air of the court room made it impossible to follow a severe logical argument. The weather bureau does a great work in economic psychology.

"We have gathered a long list of ejaculatory expressions and unpremeditated remarks concerning weather, which furnish data of interest. Commercial travelers often make much account of it. The head of a factory employing 3,000 workmen said: 'We reckon that a disagreeable day yields about ten per cent. less work than a delightful day, and we thus have to count this as a factor in our profit and loss account.' Accidents are more numerous in factories on bad days. A railroad man never proposes changes to his superior if the weather is not propitious. Fair days make men accessible and generous, and open to consider new problems favorably. Some say that opinions reached in best weather states are safest to invest on.

"Nothing is more curious than the way these ideas have been wrought into description of heaven and hell, whether in heathen, classic, or Christian writings. Hell is very hot or cold, and aggravates pains of all diseases. The *Dies Iræ* was a day of wrath suggested by a day of storm and earthquake.

"Laboratory investigation of the subject meets at the outset the difficulty of distinguishing results of weather changes from similar states otherwise caused. This difficulty is no greater than are many other topics of research, and we believe will not invalidate our methods and results. All our senses put us *en rapport* with the external world. The knee-jerk seems proven to have a weather factor. It is not strange if the eye, *e. g.*, which wants the normal stimulus, in long dark weather causes other changes. Changing moisture in the air changes odors, and many appetites are affected, as touch is still more obviously. Tea-tasters work best on fair days."

Many neurologists have studied with profit the relation of meteorological changes to neuralgia, chorea, and other nervous diseases; and since these morbid conditions of the nervous system seem so easily affected by weather, how much more frequently must the morbid psychic substrata be influenced by barometrical, thermometrical, and electrical states of the atmosphere, and by humidity and the like? But there are many difficulties in the way of investigating the relation of weather to diseased mental conditions. We have noticed among the insane in the asylums exacerbations of mental excitement, the evolution of new delusions, the appearance of novel auditory and visual hallucinations, the development of curious paresthesiæ that alter the kinesthetic perceptions which go to make up personality, under the stimulus of marked meteorological variations. This is a wide field for alienists residing in asylums to explore, and we doubt not that many valuable results would be obtained from a careful, scientific observation of the relations of the weather to psychoses. *American Medico-Surgical Bulletin.*

## Hygienic.

FOOD HYGIENE. W. J. Moody, M.D., (Food, 1894, V., No. 1, 303).

"So we are forced to the conclusion that luxury and physical perfection are in an inverse ratio to each other." In conditions where the food supply is abundant and is obtained without manual labor, and in those where the food supply is scant and difficult to be obtained by manual labor, the results are different in the manifestations of health and vigor in the constitutions of men.

In the former, man receives more than his systemic powers can dispose of without detriment to stomach, liver, kidneys and heart; while, in the latter, the mere necessity of toil and the limited acquisition set up and maintain an order of things most favorable to digestion and assimilation. But in all cases there should be some degree of regularity in the supply of food, and some standard as to its quality; otherwise, the system may not be able to use it to subserve its ends, or, if using, the food is not adapted to the wants of the body. Among well to-do people there is a tendency to be wiser than Nature, and a desire to improve on many of her methods. It is not necessary, say they, to take all that she offers, but only as much of the nutritious part as can be extracted and put in a concentrated form. For the nourishment of bone and muscle they take any nutriment that contains the elements of bone and muscle. So they must have sugar, fats and starch in combination and concentration, and meats and liquors, in and out of consonance with their physical states, believing that they are doing the best things for themselves that can be done. If they were truly wise they would learn the true secret of health from the stalwart workman in the open air, feeding sparingly each day on the plain fare that his hands have earned, and resting peacefully on a bed at night from which his toil has driven away all dreams and specters.

To secure among the people a large and strong physique, a robust and vigorous constitution, and a healthly and active brain, it is incumbent on parents to adopt and follow out a course of "systematic training of the young in the matter of proper feeding." If we could know the annual mortality among children in this country alone, due to overfeeding and improper feeding, "we should be appalled." If they escape death early and grow precariously to man's estate they bear the burdens picked up in the nursery or in the school, that weigh heavily on them all through life.

Aside from the intrinsic merit of the article under review, it is valuable as a warning to the many who live in luxury, and as a comfort to a greater number who earn their daily bread by incessant toil. It is a demonstration that no one can have all with immunity from human ills, and that one can have but little and yet enjoy health of mind and body. The author's idea is a true one, and can be set forth in the Latin phrase, *In media via tutissimus ibis. American Medico-Surgical Bulletin.*

# NOTICES.

## The San Francisco Dental Association.

The San Francisco Dental Association holds its meetings at Union Square Hall, Post Street, on the second Monday evening of each month.

All members of the profession, and especially visitors from abroad and from the interior, are cordially invited to attend these meetings and to contribute to their success.

The officers for the present year are: Dr. C. L. Goddard, President; Dr. Frank C. Pague, Secretary; and Dr. G. N. Van Orden, Corresponding Secretary.

The annual meeting and election of officers is held in October.

## Joint Meeting of the Iowa and Nebraska State Dental Societies.

The annual meeting of the Iowa and Nebraska State Dental Societies will be a joint meeting held at Council Bluffs, Iowa, and Omaha, Nebraska, May 1st to 4th, inclusive. An interesting programme will be presented. All are cordially invited to attend.

W. C. DAVIS, *Sec. Nebraska Society,*
LINCOLN, NEBRASKA.
F. T. BREENE, *Sec. Iowa Society,*
IOWA CITY, IOWA.

## Northern Ohio Dental Association.

The thirty-fifth annual meeting of the Northern Ohio Dental Association will be held at the Beebe House, Put-in-Bay Island, on Tuesday, June 19, 1894, at 2 o'clock P. M., (instead of the second Tuesday in May as formerly announced,) continuing in session three days.

A very interesting programme has been arranged for this occasion, including papers and discussion upon the following subjects: Immediate Root Filling; Systemic Disturbances and their Relation to Dental Diseases; Correcting Irregularities of the Dental Arch; Local Anæsthetics; Porcelain Work; Things New in Dentistry; etc.

Special arrangements have been made with the proprietors of the Beebe House, whereby reduced rates have been secured, also the use of rooms for meetings and clinics.

A steamer will leave Cleveland at 8 A. M. daily and arrive at the Island at 12 M. Returning will leave the Island at 4 P. M. and arrive at Cleveland at 8:30 P. M. At Sandusky boats leave and return at all hours.

A cordial invitation is extended to all members of the profession to be present.

# CORRESPONDENCE.

GOSHEN, IND., March 28, 1894.

*Dear Doctor*:—I wish to inform you of a death produced by the injection of cocaine for the extraction of teeth.

It occurred in the office of a dentist of this place to-day. He is an excellent dentist and a man of thirty years experience. The solution used was taken from a formula recommended by, and published in the January number of the *Dental Practitioner and Advertiser*. I was summoned to the office with physicians soon after the toxic effects were noticed to be serious. The Dr. had injected about 10 min. of the solution, and had extracted two badly-decayed molars, when the patient complained of some weakening effects. The usual toxic effects produced when too large a dose has been administered, as you understand much better than I do. All known restoratives were administered, but with no effect.

The Dr., I can assure you, is a careful man and a student of your friend, I believe, Dr. Brown, of Fort Wayne. I write you the facts of the case thinking that it may interest you, and to prevent any false publication. The patient was the Cashier of the First National Bank, and a man who has long been a sufferer from rheumatism, and is about fifty years of age. I desire that no responsibility be thrown upon the dentist, as he was not to blame. Some valvular heart trouble has also been diagnosed by his physician, from which he has also suffered.

Yours respectfully, E. P. CUNNINGHAM.

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## For Regulating Teeth.

BY J. F STEELE, D.D.S., ESTHERVILLE, IOWA.

A very cheap appliance can be made for regulating teeth, and one that will do the work in all cases with tools and materials that every dentist has in his office, at least he should have. The articles are as follows: Silver composition strips, invention of Dr. Parmly Brown, made by S. S. White Co., one dozen in box, price fifty cents per box; the next is the Stub's Screw Plate and Taps, made in England, can be got of any dental depot, one dollar and fifty cents.

Select a strip the proper width, wrap it around the teeth you want to anchor to, make a screw and nut of No. 20 American standard gauge wire, flatten the wire and cut off a piece for the nut, make a hole in one end of bolt, make a fine wire loop, put through hole in bolt, pass it over the tooth that you want to draw in place; now, drill a hole in the metal strip opposite the position you want the tooth to take; pass the bolt through and put on your bur and pull as long and strong as you please. I have drawn teeth five-eights of an inch in three weeks with this system. I have used it successfully in over twenty-five cases; try it, you will be highly pleased with it, I am sure.

I am preparing an article on making crowns of plate teeth, that is, pivot crowns; also one on bridge-work, combination of metal and rubber. I have some cases of bridge-work that have stood the test for ten years.

## The Mississippi Valley Dental Association.

The forty-ninth annual meeting of the Mississippi Valley Association of Dental Surgeons convened in the lecture room of the Ohio Dental College, pursuant to the following circular sent to the members of the Association:

CINCINNATI, O., March 6, 1894.

*Dear Doctor*:—For several years it has been a question among the members of the Mississippi Valley Association of Dental Surgeons. "Has the society outlived its usefulness?" There was a time when this society accomplished the greatest amount of good, but conditions have changed. City, District, State, National and International organizations have occupied the field. A society representing the Mississippi Valley does not seem a necessity. Men of talent have all their spare time taken up attending to the other organizations mentioned. Last year there was no meeting on account of the Columbian Dental Congress. This year there is, as yet, very little prospect of a successful meeting. The officers do not feel that they care to take the responsibility upon themselves of saying that the society shall or shall not be abandoned. Therefore, let this be notice to all members of the Mississippi Valley Dental Society, that there will be a meeting of this society, for the purpose of deciding upon the continuance or abandonment of the Association.

To be held in the Ohio Dental College Building on the 28th day of March, at 2 P. M., 1894.

DR. O. N. HEISE, President,
82 Garfield Place.
DR. J. R. CALLAHAN,
Chairman Ex. Com.
DR. H. T. SMITH, Secretary,
128 Garfield Place.

Pres. Dr. O. N. Heise called the meeting to order, and after reading the above circular the following resolution offered by Dr. J. Taft was adopted unanimously:

"That it be considered the sense of this meeting that the Mississippi Valley Association of Dental Surgeons be continued."

Drs. J. S. Taylor and Betty, Membership Committee.

The following gentlemen were unanimously elected to membership: W. H. Gillette, H. F. Vandervoort, W. B. Fahnestock, and W. S. Locke, all of Cincinnati.

On motion of Dr. Molyneaux, the annual dues for the present year are to be remitted and new members shall pay only the initiation fee.

On motion the Treasurer was authorized to pay all current bills.

On motion of Dr. Callahan, the date for the next meeting shall be the day following the date of the Commencement of the Ohio Dental College, and shall be held in Cincinnati, and it shall be considered the Semi-Centennial Meeting of the Association.

The following members were present: Drs. J. R. Callahan, J. Taft, C. M. Wright, M. H. Fletcher, G. Molyneaux, A. E. Emminger, Jas. Leslie, F. A. Hunter, H. C. Matlack, W. Taft, E. G. Betty, J. I. Taylor, Chas. Welch, H. A. Smith, O. N. Heise, H. T. Smith, W. B. Fahnestock, H. F. Vandervoort W. H. Gillette, W. S. Locke, J. B. Dillon, W. O. Hulick, and A. G. Rose.

The following officers were elected:

President, Dr. J. Taft, of Cincinnati, O.

1st Vice-President, Dr. W. B. Ames, of Chicago, Ill.

2nd Vice-President, Dr. A. E. Emminger, of Columbus, O.

Treasurer, Dr. F. A. Hunter, of Cincinnati, O.

Corresponding Secretary, Dr. H. C. Matlack, of Cincinnati, O.

Recording Secretary, Dr. H. T. Smith, of Cincinnati, O.

Executive Committee—Drs. J. R. Callahan, Cincinnati, O; M. H. Fletcher Cincinnati, O; and L. E. Custer, Dayton, O.

# EDITORIAL.

## Bibliographical.

The Sanitarian. The Sanitarian is a monthly magazine devoted to the promotion of the art and science of sanitation, mental and physical in all their relations. By an investigation, presentation and discussion of all subjects in this large domain, as related to personal and household hygiene, domicile, soil and climate, food and drink, mental and physical culture, habit and exercise, occupation, vital statistics, sanitary organization and laws, in short, everything promotive of or in conflict with health.

Its purpose is to render sanitation a popular theme of study and universally practical. We regard the Sanitarian as one of the best, if not the very best publication of the kind in America, and it has certainly been the means of accomplishing great good. It is a publication in which all who have any interest in public health and welfare should have within reach, and should aid in its distribution amongst the people.

It is published in New York. Dr. A. N. Bell, Editor, Brooklyn, N. Y. The American News Co. is the agent. Subscription price, $4 00 per year.

TRAVER'S DENTAL EXAMINATION REGISTER FOR THE PROPER RECORDING OF EXAMINATIONS OF THE MOUTH, AND OF OPERATIONS UNDER WAY AND COMPLETED.

This is a very complete work for this purpose and enables any one to make complete record of the condition of any case that may be in hand. Every peculiarity, whether of decay, disease or otherwise, may be most perfectly recorded in this work with the least possible expenditure of time. All such records are invaluable for future reference, and especially if they are faithfully kept and brought up in the future as examination may be made of the several cases from time to time. Keeping such record has been altogether too much neglected by the profession, and those very interesting and instructive cases pass from sight and knowledge, and the lessons that ought to be learned in this way are lost. We know of no record book so complete in all respects as this. We feel confident that those who will test its utility will find in it about all they could desire.

It can be procured of the Dental Supply Co., Racine, Wis., and we presume of any Dental dealer.

# THE DENTAL REGISTER.

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## COMMUNICATIONS.

### Infection from the Mouth.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

BY E. L. CLIFFORD, D.D.S., CHICAGO.

[*Continued from April Number, page* 198.]

Now, as to the clinical, pathological and practical aspects—according to the different sources of poisoning, or intoxication, as it is technically called, there are correspondingly different indications, signs or symptoms which Dr. Brown classifies as follows: 1, poisoning by the extractives is attended by *hyper*-thermia; 2, poisoning by " animal alkaloids" is accompanied by *hypo*-thermia; 3, a combination or succession of *hyper*-thermic and *hypo*-thermic phenomena may become manifest, according to the combination or alternation of poisoning by the deleterious physiologic products, or their antagonistic action. Some contradictory evidences of the above are accounted for as follows: " Where 'extractive matters' accumulate in the blood we detect hyperthermia; on the other hand, if 'alkaloids' accumulate, we have hypothermia, while if the two factors co-exist they may neutralize each other, or become antagonistic in their action, so that temperature may remain stationary or normal. But should one or the other predominate, immediately the scale is turned, so that some variation may be noted. In this auto-infection, this spontaneous or self-infection, of the living organism by the alkaloids and extractives of its own formation there is no question of quality, but simply one of quantity to be considered, by reason of the essential physiologic source and action of the poison. In other words, the healthy living organism may become poisoned (more or less slowly) by the accumulation within itself of deleterious substances normally elaborated, but imperfectly or defectively eliminated. Hence the slow and insidious onset of much ill-health, and from which recovery is correspondingly slow." Now, in what way does this auto-infection of the system take place? Brown tells us that it can only be understood and explained by the mode in which we regard the phenomena of life. Life is a ceaseless decay with a ceaseless repair. "Normal health is conditioned on an incessant formation, transformation and elimination of the effete or old organic materials which must give place to new. It is this effete material, which, therefore, represents a series of partial deaths, and which, as the result of organic functional operations, constitutes life, during which the tissues and organs in the processes of their metabolic changes perform a constant function of disintegration, fabricating during these processes those alkaloids and extractives, those **x**, **y**, z's of pathology which must be regarded as veritable '*physiologic ashes*' (Brunton), resulting from the processes of combustion of the elements of organic tissues."

Having progressed thus far, and established the fact, we think, of the presence and power of these poisonous agents, let us for a while cast a glance at the oral cavity of man, and see if any conclusions can be drawn as to the part it plays in promoting or preventing the formation of these factors in the causation of disease.

1. We will claim that no portion of the organism is of more importance, or is more active as a veritable chemic laboratory, than the mouth. It is established, that in the processes of putrefactive decomposition, certain alkaloids are elaborated from the proteid substances. We all know that in the cleanest mouths certain portions of these proteid substances will remain, as they are ingested with the food we take, as well as the water we drink, and the air we breathe. We know also that in the cleanest and healthiest mouths, absence of bacteriologic influences is but an

utter impossibility, and that these micro-organic agencies, furnished as they are with the proper media or food, conjoined with a suitable temperature and abundant moisture, make the mouth one of the best incubators that can be imagined. If this be so in mouths that have been no strangers to proper hygienic influences, how much more strongly is the fact established of the influence of this territory, when carelessness and neglect have been a predominant feature? And, if we accept the theory of Aitken that these alkaloidal products vary as to their poisoning power according to the stage of decay at which they are produced, how important is it that these hygienic influences be enjoined and enforced. Then again, accepting the dictum of Gautier, that these animal alkaloids can not be excluded from the general economy, and that they are even necessary as a product of vital physiologic processes, it certainly becomes the duty of that branch of medical science to which the very entrance of the digestive tract is allotted for control and treatment, to see to it that contaminating influences are eliminated. Again, if the possibility of the formation of these animal alkaloids is acknowledged without the aid of bacteriologic fermentation, as shown by Gautier, how much more deleterious must be their effects, and how much greater must be their production when conjoined to and assisted by these physiologic agencies. If an abnormal amount of these poisonous substances is produced within the intestines when in any way disordered, how much more reasonable to conceive that the manufacturing capacity of the mouth is greatly increased, when a condition that might be termed absolute filth is no stranger to the eye of the observant dental practitioner. If the amount of these agencies formed in the intestines of a healthy man in twenty-four hours is sufficient to kill him if absorbed and secretion stopped, it will require no great stretch of your imagination to realize that enough poison could be taken from the mouth of the average dental patient to kill a small army of inoculated subjects if properly applied. Let the physician who doubts this statement recall the condition of wounds, and ponder over the difficulties of his prognosis when called to attend a traumatism caused by the human bite. The conclusions of

Dr. Brunton will also go far to account for the thermal changes which take place and accompany these traumatisms, when viewed from a clinical or pathological standpoint. Miller establishes well the part played by the human mouth as a generator of micro-organic life, and his testimony is corroborated by other investigators; not only are large quantities of the animal alkaloids produced within the intestines and other portions of the alimentary tract, but large quantities are swallowed with innumerable bacteria which have already been produced in the mouth, and, as stated by Miller, they give rise to local and general disorders of the most serious nature, produced partly by the direct action of the micro-organisms, and their products upon the teeth and the mucous membrane of the mouth, partly by swallowing large portions of bacteria, partly by carrying them into the lungs, particularly in cases of violent inspiration, and finally by their obtaining an entrance into the blood or lymph vessels in various ways, such as by a breach in the continuity of the mucous membrane brought about by mechanical injuries (wounds, extractions, etc.), through the medium of gangrenous tooth pulps, which usually lead to abscess at the point of infection; sometimes with secondary septicemia and pyemia with fatal termination, by resorption of poisonous waste products formed by bacteria; by the inspiration of particles of slime, small pieces of tartar, etc., containing bacteria, and by contact with the oral and pharyngeal cavities, whose power of resistance has been impaired by debilitating diseases, mechanical injuries, etc.

The very antechamber of man's vegetative existence, the very portal of the human body, furnishing as it does a most excellent nursery for these etiologic factors, has not received from the general profession of medicine, within the past, that attention which its importance has deserved; but, thanks to the work and investigations of some of the members of our specialty, the physician can no longer ignore these factors and feel that he has done justice to himself and the patient who has so confidently placed himself under his care. The results of the last few years have proved that if many of the diseases whose origin is enveloped in mystery could be traced to their source, they could be found to have originated within the oral cavity. And, as to the danger of such diseases as do follow from infection traced directly to the mouth, it seems there could be but one thought, when we reflect that out of a carefully prepared table of 149 cases by Miller, there resulted 50 deaths, 19 cases of syphilis, 2 cases of blindness and 2 cases of a loss of a part or the whole of one of the maxilla.

Most of the work which has been done up to this time (with the exception of that by Miller) has been with a view of attracting the attention of the dental specialist to infection which has been carried *into* the mouth from without, resulting in local manifestations which would naturally come under the supervision and treatment of the dentist. Miller has opened up, and is cultivating with skill and determination a new field of research, and it seems to be his object, as it is mine at this time, to attract the attention of the general practitioner to infections which are carried *from* the mouth and are planted in such soils as will prove favorable to their future germination and growth, hence, proving an obstacle in the path of him who would assume to treat these pathologic lesions, without due appreciation of the important part these agencies and this location play as factors in etiology. It would not be difficult to convince the observant dentist of the truths here implied; it would only be necessary, were that our object, to ask him to recall from his every-day experience ample facts to substantiate the position. He has seen many times the general health of his patients vastly improved by a proper care and attention of the mouth. He has studied, as a specialist, the chemic powers of decayed teeth, vitiated and poisoned secretions, and fully appreciates their power and influence, but I am forced to the belief that the physician of the past has either willfully or ignorantly ignored the important part this portal plays in the aggravation of diseases, or as a preventive of cure. And this thought is only enhanced and enlarged by the recent practices of the more observant and faithful, in calling to their assistance the aid of the competent orist, in assisting him to re-establish physiologic perfection.

To make the attempt to enumerate and to classify the different ailments which are either caused or aggravated by the unhealthy and unwholesome condition of the mouth, would be too great a task for one paper, if it were necessary, but it is not. Miller has done and is doing this work for us, and it is our province to assist as much as possible in bringing to the notice of the profession the excellence of his work and the importance of his conclusions. At such times as this, we can but generalize. Every physician of experience has often, no doubt, found himself in the dilemma of not being able to account for the cause of many cases in practice—and while I would not have him look to the mouth as the harbinger of all these causes, I would ask his attention to that sphere, as a possible, and I might say, a probable source in many cases.

There is no doubt that the nervous system in many instances, and by very remote manifestations, is often injured to an alarming extent by the mechanical or chemical irritation emanating from an oral organ. The alimentary tract, we know, is often deprived of the privilege of doing its proper duty by contaminations implanted into the first bolus of food, started on its course through a filthy and poisonous mouth, and added to the chemic contamination may well be mentioned the mechanical, which in cases of malocclusion, tender and sore teeth, or edentulous mouths prevent a proper mastication of food, entailing upon the stomach an office and a duty never designed by nature. This overwork of the stomach, combined as it often is with the chemic poisons of the diseased mouth, of course is sufficient to interrupt the proper function of other organs in the tract as they are reached, and consequently the whole canal becomes a source of irritation and of poison. Now, the primary source of health and growth being so far drawn from the path of rectitude laid out to furnish man with ease and not disease, it is evident that future digestion, assimilation and nutrition is only a matter of impossibility. If the ptomaines, leucomaines and extractives are found in every organism, and under all conditions, it is only rational to believe that an all-wise Providence has designed them for a specific and for a physiologic purpose. They have a function to perform, even though it were only that of scavengers for other tissues. It would certainly not be wise to place a minor importance upon the function of the kidneys, simply because their principal office seems to be that of eliminators—on the contrary, the more reason why their integrity should be preserved and their powers not deteriorated, in order that those substances which seek this channel may be thrown off and not left to accumulate, to contaminate and to poison what would remain healthy.

Likewise, if micro-organisms are so universally present, the same facts would equally apply to them, and it is to the prevention of a growth of an abnormal quantity, and to the prevention of the introduction into the organism of specific germs, that the attention of the therapist of the future will be more particularly directed. If we could only get our medical confreres to pay more attention to the chairs of oral and dental pathology that have lately been introduced into our colleges, to the sections on these subjects that have been attached to all the congresses and national associations of late years, we believe they would more fully appreciate their importance, would more often seek the advice and assistance of the specialist, and this in turn would create a bond of union between us and them, stronger and more appreciated than any that has existed up to this time.

Aside from local inoculations and their results, which are usually classed among dental diseases, there are many forms of aberrations that the condition of the mouth may be held especially responsible for. Paralyses, pareses, anesthesias and hyperesthesias adorn the border line where it is difficult to determine whether the case is one for the specialist or the general practitioner; but these lesions, having long been noticed as doubtful in their etiology, are not classed among the obscure, and are often brought to the notice of the specialist and his assistance sought. But in those more obscure cases where the cause is greatly clouded, mistakes are more liable to occur, and the physician often battles vainly in his efforts to restore a healthy status by the ever interfering and constantly infecting products of this portal to man's existence. Miller has shown that pulmonary and bronchial diseases are excited or aggravated by the inspiration of germs from the oral cavity, as evidenced in the case cited of J. Israel, where primary actino-mycotic infection followed the lodgment of a small piece of tartar within the lung. Several cases within my own practice confirmed the theory, and I have more than once seen the benefit, and been able to bring it forcibly to the notice of the attending physician, where marked improvement followed the sterilization of the mouth, when all efforts had proved fruitless prior to this step. Alimentary disorders are of such common occurrence, as a result of defective and contaminating mastication, as to require no extended notice, and from this one condition all other organs are more or less affected, both nervous and vascular. Bednar, said to be the first to give clear expression to this view in 1854, states that, "indigestion may be brought about *directly*, by taking into the stomach any substance already in a state of fermentation; *indirectly*, when the food taken into the stomach undergoes subsequent fermentation on account of its disproportion of the gastric juices." Henoch favored this conception and found in it a cause for a large number of diarrhœas, while Minkowski classsifies under five heads the disturbances directly caused by the fermentative processes in the stomach:

1. Substances may be formed which irritate the mucous membrane of the stomach, and bring about a state of catarrhal inflammation.
2. Considerable quantities of gas may be found heightening the mechanical insufficiency of the stomach.
3. Fermentations may lead to the production of substances having toxic properties.
4. In the fermentation of albuminous substances, alkalin products may arise which neutralize the gastric juice.
5. The gastric fermentations may exert a great influence on the functions of the intestines.

And now, what is our lesson? We would ask the general practitioner to regard the unhealthy condition of the oral cavity, with all its contents, as an important factor in the causation or aggravation of diseases, having shown, as we believe, that within its boundaries lie the primary causes of many pathologic lesions; that good, healthy, clean and serviceable dental organs are absolutely essential to the enjoyment of physiologic ease, and that in many cases the dental specialist has within his power the rendering of valuable assistance in the search for this result.

### DISCUSSION.

DR. J. S. MARSHALL said that the paper opened up a field of thought to all dentists, and the application made to the diseases of the general system will make it valuable to the general practitioner. Almost every pathogenic micro-organism has been found in the mouth by Dr. Miller, and we can not be too careful about introducing them into our own systems when operating. Upon two occasions he had pricked his finger while at work, and each time had troublesome sores from the accidents, showing that there was more than a mere wound to deal with.

DR. TALBOT said there were, no doubt, many cases where a foul condition of the mouth was responsible for troubles in the general system, and where an improvement in health and increase in weight had followed the putting in order of the mouth. The infection from the mouth of a patient, too, had often caused trouble to the dentist, such as inflammation of the eyes and perhaps sore throat, consumption, and tonsillitis.

DR. TAFT said we should promote the function of the eliminative organs; the skin should be kept clean, the liver active, the kidneys, lungs, etc., in good condition, and then there will be less likelihood of infection from bacteria. Care should be taken to regulate the food supply as to quantity, quality, and the proper preparation; these precautions, with reasonable effort toward keeping the mouth clean, will be sufficient to guard against these infections. He also spoke of the habit of mouth-breathing, and said dentists should impose on all their patients the necessity of keeping the mouth closed as much as possible.

DR. CLIFFORD said that the main idea in his paper was to call attention to the effect the micro-organisms of the mouth had upon the general condition. Dr. Taft spoke of keeping the eliminating organs in good condition, but this can not be done unless the mouth is kept clean, for if the mouth contains enough poison to keep the blood, liver, and skin in bad order, they can not be got right until the mouth is rid of the cause of the trouble.

# Devitalization of Dental Pulp.

BY A. W. DIACK, D.D.S., DETROIT, MICH.

Read before the Detroit Dental Society, March 12, 1894.

Among the many obstacles that have presented themselves to me, and which have a tendency to induce worry and anxiety, since I have been in practice, not the least has been the discovery of exposed pulps. They are to me a precursor of subsequent trouble; for either they require a great amount of nervous and skillful work or else the patient will lose all faith in the so-called modern methods and painless dentistry of recent years.

Without entering into a discussion concerning the advisability of conservative treatment, but passing on to that condition where we are resolved that the pulp shall be killed, I will consider the subject of the "Devitalization of Pulps," and I will aim, so far as possible, to bring forth some method, by discussion, which will be more for the patient's comfort than the one which is now employed by the profession generally.

There are two things to be attained in this operation before we, as dentists, and the public, as patients, are to be thoroughly satisfied; that is, before we can have a painless devitalization.

The first is the rapidity of the devitalization, and the second is either a new agent for the purpose or else a new method of manipulating the old.

These divisions, as you can see, are merely arbitrary and are really mutually dependent on each other; for I am a firm believer in the fact that dental patients suffer more in the anticipation than realization, and that if we cause a patient to come several times and at each sitting do some painful work, we shall find that the last sitting is always the worst, and that the patient acts in a more nervous manner. So I say that if we succeed in shortening the period of devitalization we have taken a step toward making the operation painless.

To pass on now to the agents used: Formerly, there were several methods in vogue, among them the operative procedure of removing the pulp without the previous application of a medicinal agent. Even, now, I have heard and read of those advocating this method, some saying that they never resort to the ordinary means. To my mind this is only a relic of barbarism, or else my opinion is based upon my own lack of ability.

Among the medicinal agents used, were the capping with the oxychloride and oxyphosphate of zinc, prolonged applications of carbolic acid, creasote, etc. But these have generally been allowed to pass into disuse, owing to the long time necessary to accomplish the result and the great uncertainty of the action. Sufficient to say, that the agent which is pre-eminent in this branch is arsenious acid. It was first used, I believe, some fifty years ago, and has held its own against all other drugs ever since. Several theories have been advanced to account for its caustic action upon the dental pulp, but I will not enter upon that at all, other than to mention the fact that it caused in many instances great nervous irritation and pain. It is this physiological effect which we must overcome if we would have a painless operation. Several agents have been combined with the arsenic to overcome this, but as yet to my knowledge there has been nothing which accomplishes the result.

The ordinary application consists of equal parts of arsenious acid and sulphate or muriate of morphine, made into a paste by the addition of creasote or carbolic acid. Other preparations have contained other agents instead of the morphine. One preparation, the formula of which is a secret, is spoken of highly by its users.

My method of using this application, which I think is the method in general use, is to clean the cavity of decay as thoroughly as possible and expose the pulp, so that there will be free access to the blood vessels, and if possible cause a few drops of blood to flow from the pulp. Then about one-sixtieth of a grain of the arsenic in combination with the morphine is spread gently over the exposure. A small piece of loose cotton is then laid over the application, and the final piece of cotton moistened with sandarac or chloro-percha previously warmed is placed so as to prevent pressure upon the pulp. The cavity, of course, is kept free from moisture, either by the rubber cloth or the napkin. The patient is then discharged for twenty-four or forty-eight hours, and at that sitting the subsequent operation is begun, if all is well. If not, as I can easily tell by the sensitiveness of the pulp, I repeat the application as before, except that I sometimes allow seventy-two hours to intervene before the next sitting. Even then the pulp in some cases seems unaffected. These cases are then given a prolonged treatment dependent upon circumstances.

Now, with this method, in the majority of cases, I find considerable pain even though I have taken special care in making the application. I have tried in several ways to overcome this pain, both by the use of local means and systemic analgesics. Systemically I have used acetanilide and phenacetine, the former in the form of tablets of the acetanilide compound, which contains:

Acetanilide, - - - gr. ij
Camph-Monobrom,
Caffeine Citrate, - - aa gr. ss

Phenacetine I have used in doses of ten grains to be followed in an hour by five grains in a teaspoonful of brandy.

To say that these have been successful would be exaggeration, for contrary to the observations of other men, I have found them of doubtful efficacy. To illustrate, a young physician presented an upper right first molar; the nerve had been in a state of chronic inflammation for several years, as was shown by pain at irregular intervals, and an uncomfortable feeling in the tooth. This condition was the result of having a large metal filling almost directly in contact with the pulp. I exposed the pulp and made the application in the ordinary manner. The patient suffered very much, and I prescribed phenacetine in ten grain doses. He reported the next day, as I told him, and said that he continued to have more or less pain until the following morning, although he had taken other anodynes than the phenacetine. He had kept an account of what he had taken, and I found that he had taken: thirty grains of phenacetine, twelve grains of acetanilide, together with the camphor and caffeine, and three-quarters of a grain of codeine.

This has a tendency to make a person rather skeptical regarding the good to be obtained from systemic drugs.

As a local sedative, for the devitalization of dental pulps, I have used several agents in the place of the morphine, which drug I believe has very little anodyne properties, tannic acid, aristol, iodoform, hydrochlorate of cocaine and oil of cloves; all have been used in the mixture but with negative results, at least in my hands. Recently, however, I have been using a mixture of belladonna extract and arsenious acid, in proportion of two of the extract to one of the acid. This is made into a paste with glycerine.

I use the extract of belladonna because of the well known anodyne effect of the drug on the sensory nerves. The glycerine I use because of its emollient property and also because of its power of being easily absorbed. I have used this formula in several cases, and, so far, feel very hopeful, as I have yet to hear of any severe pain. But it is altogether too soon to even predict any decided results. Perhaps at some future time I will be able to praise the formula in stronger terms, unless I become disgusted with it as I have with the others.

I came across a case, not long ago, which puzzled me considerably, and which I think will shed some light upon this subject.

A young man aged twenty-three, of good health, presented a lower left first molar, the crown of which was about one-third destroyed by caries. The dentine was covered with that decay of the reddish-brown, leathery character, which is seen so frequently in these cases. Patient never had any pain in the tooth previous to that time, but then he was suffering very much. I made a diagnosis of pericementitis, caused by death of pulp, and opened into the pulp chamber. When the entrance was effected a discharge of pus amounting to four or five drops took place; this was soon followed by blood. Pain was temporarily relieved, but soon reappeared. I then made the entrance to the chamber as large as possible, but was unable to accomplish much, as the pulp was extremely sensitive. I treated the pulp to allay pain and reduce inflammation, and told the patient to return the next day. He had slight pain during the interim. At the second sitting the pulp could not be touched, being so sensitive. I made an arsenical application and asked the patient to return next day. This was done, but no diminution of vitality was appreciable.

The application was repeated at least four times, but with no results. I finally used hydrochlorate of cocaine in crystals, and removed part of the pulp, but even this ceased to have an effect. At this stage the patient and myself both being discouraged I extracted the tooth. A curious condition existed in this case, which I think accounts for the lack of any action of the arsenic or cocaine. The color of the pulp, instead of being of that reddish shade, was pale and colorless, and after the first sitting there was no hemorrhage at all. It seemed as though the blood vessels were entirely devoid of function, while the nerves of the pulp retained their functions in an exalted degree. This explains why the medicines were not absorbed; and I believe this is a condition which exists to a greater or less degree in those cases where repeated applications are necessary.

Now, gentlemen, to some of you it may seem that I am making a mountain out of a mole hill, in taking this subject, but I have felt justified, and no doubt will again feel justified when I hear the complaints of patients when the subject of "nerve-killing" is broached. I am convinced that in a great majority of cases the operation is more to the patient than we think. It means in some instances so much of pain that the patient is very unwilling to undergo a repetition of it. It is not only my own patients who complain, but those of other men also, so I know that all of this trouble cannot be ascribed to lack of ability, as some of you may think from the fuss I have made in this paper. However, my chief end in writing this was to get some new light on the subject, and I hope that the discussion will shed some.

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COCAINE MAY BE TESTED FOR THUS: Add to the solution to be examined a drop of a solution of potassium bichromate. If cocaine be present a precipitate will form which vanishes rapidly, and on warming, the liquid turns green and gives off fumes having a peculiar odor—that of benzoic acid.—*The Literary Digest.*

# Diseases of the Maxillary Bones and their Periosteum.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

BY VIDA A. LATHAM, F.R.M.S., D.D.S , CHICAGO, ILL.

[*Continued from April Number, page* 163.]

*Diseases of the Alveolar Dental Periosteum.*—The principal one is inflammation (periodontitis), and its causes number at least seventeen, viz.: want of occlusion ; malocclusion; tartar ; looseness of teeth ; induration of tooth-tissue ; cavities of decay impinging on cementum ; excess of filling material ; pulpitis ; extraction of pulp without hemorrhage ; external irritation by forcible removal of pulp ; enlarged foramen ; putrescent pulp ; previous periodontitis ; action of medicines locally ; contact with arsenic ; morphin ; action of medicines systemically ; action of syphilis, fever, diphtheria, gout, rheumatism. Inflammation here is not different, pathologically, from any other, but it has special symptoms because of its position. Rheumatic periostitis is acutely painful ; does not lead to suppuration, and varies with the weather. In mercurial periodontitis the breath is very foul, and if mercury is continued the whole surface sloughs away, together with much of the alveoli. Strumous periodontitis tends to rapid suppuration, swelling and abscess, and is less painful. Periodontitis due to phosphorus fumes is apt to end in necrosis of the entire jaw-bone.

The varieties of periodontitis are :

1. Acute, sub-acute and chronic.

2. Traumatic.

3. Absorption of roots in diseased condition of the membrane and after injuries, transplantations, replantations, etc. When the membrane is healthy, no absorption of roots of permanent teeth takes place.

4. Apical. Confined to the end of the root, following death of pulp.

5. Gingivitis. Inflammation of peridental membrane at border from constitutional causes, as ptyalism.

6. Calcic inflammation.

7. Phagedenic. A specific infectious inflammation having its beginning in the gingival border, and accompanied by destruction of the periodontium and alveolar walls. Riggs' disease. Periodontitis may be local or general, the majority of cases being the latter.

Repair of the peridental membrane is said never to take place by first intention, but always by granulation, which may begin in the tissue overlying the parts of the root, but the re-attachment creeps in from the injury where the peridental membrane is intact or from the extremity of the pocket above, and slowly covers over the denuded portions of a tooth. Sponge-grafting has been suggested to renew the gingival and lower border of the peridental membrane when lost from phagedenic periodontitis.

Periostitis, both acute and chronic, affects the jaws. The acute form is a dangerous one, as it so often runs into suppuration with consequent necrosis. It is only in the early stage that it can be recognized. The more chronic form is commonly connected with syphilis, and leads to the formation of nodes about the palate and enlargement of portions of the inferior maxilla, and it may be well to mention that many cases of persistent facial neuralgia, which are unrelieved by quinin, etc., yield to potassium iodid, and may be said to depend upon chronic periostitis or osteitis with, probably, pressure on the dental nerves.

Necrosis. This disease affects the inferior much more commonly than the superior maxilla, probably in consequence of its being less vascular. (Heath.) Beginning as periostitis from dental irritation, injury, action of specific poisons, the symptoms generally are, pain with pyrexia; part swollen, ingested; teeth raised and unable to bear any pressure. If immediately relieved by leeches, free incision, hot poultices, etc., the symptoms may subside and no further injury result; but usually pus will be found beneath the periosteum before the patient comes to you, and even then, though evacuated instantly, necrosis is usually the result. Luckily, necrosis sometimes only affects the external plate of the alveolus, so you get the teeth supported by the internal plate and you can keep them in situ; but when the entire alveolus is involved, the teeth loosened and possibly useless, they had better be removed, as they only stop up the discharge. Do not attempt to remove sequestra unless you are sure they are completely loosened, or you may inflict injury on the surrounding parts and interfere with the process of repair, and this is especially the case with children in whom the second teeth are still undeveloped. The time of separation is difficult to decide on, for we must depend on the strength of the patient, and the extent and position of sequestrum. It takes usually about six weeks to three months before large sequestra can be safely removed.

Another form of necrosis is the exanthematous, so named by Salter. This name is applied to the diseases found in young children, usually after attacks of specific fevers, especially scarlet fever and small-pox. Necrosis of portions of the alveolus of either maxilla which usually occurs on both sides alike, or even when it involves the whole thickness of the lower jaw, is now taken as one of the sequelæ of these diseases; and possibly many cases in years gone by, thought to be due to calomel, were solely due to the action of the specific poison. The repair of bone in necrosis of the upper jaw is a little different from that of the lower. No reproduction of bone takes place, the gap left in adults being permanent, though in children, the subjects of exanthematous necrosis, the granulation tissue is slowly converted into fibrous tissue, which does not as a rule ossify. In the inferior maxilla, abundant new bone is formed by the periosteum, and for a time, at least, most extensive losses are repaired. It is certain, however, that in the course of years, a great, if not a complete re-absorption of new bone thus formed takes place, the patient being left finally with very little if any support for artificial teeth. Prof. Salter has suggested that the early application of artificial teeth would tend, by use, to strengthen and maintain the permanence of the new bone; but I believe there are no facts to support this view.

The action of the fumes of phosphorus is well known to cause necrosis, but is less common now than formerly, on account of the substitution of red amorphous phosphorus for the yellow variety. It only occurs when the teeth are carious and the jaws in an unhealthy state. Those with carious teeth who work with phosphorus are always affected, and the necrosis is violent and rapid. The disease may begin as osteo-periostitis which rapidly ends in necrosis, or it may begin by osteo-plastic inflammation, swelling, profuse and offensive suppuration of the soft parts, attended with pyrexia. These symptoms are sometimes followed by gangrene, erysipelas and death. Sometimes the removal of the sequestrum is followed by recovery. The whole jaw is usually involved, the callus lying between the sequestra. The notable point to be observed in phosphorus necrosis is the peculiar deposit of pumice-like bone which takes place upon the sequestra. This no doubt comes from the periosteum, although so closely adjoining the sequestrum as to be almost always brought away with it; and though resembling true bone in some particulars it is a little lower developed form of bone. A deposit closely allied to this, however, has been noticed in cases in which there was no phosphorus involved, and it would appear that, in some instances, possibly of rheumatic origin, the deposit of new bone partakes of this character.

The action of mercury can be briefly mentioned here: it injures the teeth in two ways; by salivation and by the graver injury, the production of honeycombed teeth, which is often confused with the effects of inherited syphilis. Honeycombed teeth are the result of mercurial treatment during the period when the enamel is being calcified (J. Hutchinson, *Path. Soc. Trans.*, Vol. XXVI, 1875, pp. 235 et seq.) The two affections have been discussed by Mr. Hutchinson together, and because they are coincident with ophthalmic changes and the question of mercury occurs in both, much confusion has arisen. Below is briefly contrasted and tabulated these conditions:

| HONEYCOMBED. | SYPHILITIC. |
|---|---|
| 1. Are peculiar only in the latest formed tissue, the last layer of enamel. | Are most peculiar in the earliest formed tissue, the last formed enamel being usually perfect. |
| 2. Perfect at birth, become affected after a year or so. | Are imperfect from earliest germ stage. |
| 3. Are coincident with lamellar cataract, infantile fits, and mercurial treatment. | Are coincident with interstitial keratitis, inherited syphilis, and have nothing to do with mercurial treatment. |
| 4. The teeth that suffer most are the first permanent molars. | The teeth that suffer most are upper incisors. |
| 5. The general form of the teeth is unaltered. | The form of the teeth is profoundly modified. |

Mercury, as a rule, on the deciduous teeth is a lasting injury, but on the periosteum in adult life it is transient unless long continued. In mild cases, in addition to periostitis, there is a profuse flow of saliva, a mercurial fœtor of the breath, with later on swelling and sloughing of the alveolus and gums, upon which in severe cases a whitish membrane appears; this is at first lightly attached, but later is adherent, and it is *underneath this* that ulceration of the gums takes place. The teeth soon loosen and are lost, and in very bad and neglected cases the whole surface sloughs away, together with much of the alveoli, and necrosis of the whole jaw may result, and we have mercurial stomatitis.

Periostitis due to rheumatism will very likely pass away, especially if much affected by the weather, but it is often difficult to persuade a patient to retain a dead tooth which keeps up this periodical irritation. For these cases, what treatment can be given other than systemic remedies, counter-irritation, warmth and patience?

Periostitis due to syphilis or struma is not so easily disposed of, for it usually progresses to the worst degree. Salivary calculus, if removed in time, will scarcely ever cause dangerous periostitis, but the serumal is a great deal more likely to set up and prolong irritation to such a degree as to cause exostosis and its concomitants; and as we can seldom remove it unless by extracting the tooth and scraping the deposit from the ends of the roots and replanting, the prognosis is not at all favorable. When due to the last stages of pulpitis, misapplication of arsenic, the chances of recovery for the tooth are smaller.

Before noting the diseases of the maxillæ, it will be well to allude briefly to a disease of the alveoli, pyorrhea alveolaris or Riggs' disease. We are all very well aware of how little is known on this subject, and of the theories advanced. Why should we classify this as a special disease all by itself, instead of following a more logical course and regarding it as a pure periosteal one, for its pathology can be best understood if it is regarded as a form of osteo-periostitis, even though it is confined to the alveolus—

in fact a final stage of periostitis, as the effect upon the teeth is entirely secondary and consequent upon their separation from the soft parts. In its symptoms and characters, both macroscopically and microscopically, the course it follows and its amenability to various forms of treatment, it presents no special phenomena to distinguish it from simple caries of bone, save that the latter disease is almost always associated with an impaired condition of the general health. In this respect, and in the absence of fever, pyorrhea alveolaris more closely resembles Sir James Paget's *osteitis deformans*, concerning which I quote the following: "The surrounding gum becomes spongy, deep red, and sometimes tender; it separates from the neck of the tooth, while at the same time the periosteum suppurates and discharges pus, which is continually oozing out around the necks of the teeth and can be generally pressed out in great quantities. It is extremely chronic, begins generally in early middle age, and may continue for an indefinite time without influencing the general health. The early stages of the disease are sometimes attended with pain varying widely in severity. The breath is usually foul, the roots covered with irregular granular masses of greenish or blackish tartar, the discharge offensive and the whole mouth tender." The causes are not easy to find in all cases, but they are similar to those which cause periostitis. Injury of any sort to the periosteum, as cold, a blow, or excessive bite; a strumous or syphilitic diathesis seems often to co-exist.

The treatment should be based on surgical and medical principles, allowing for location, exactly like caries of bone, where the use of steel instruments is usually contra-indicated on account of the further injury which is likely to ensue. Unfortunately, our knowledge has been handicapped thus far by regarding this disease as a purely dental one, confined to dental tissues, instead of a surgical bone disease. The more the disease was regarded as dental, the more did we forget that the alveolus was only ordinary bone, subject to the same changes as any other bone, and having just as unsatisfactory treatment as caries has wherever it occurs.

### NECROSIS CONTRASTED WITH CARIES.

| NECROSIS. | CARIES. |
|---|---|
| 1. *Parts affected.*—In compact tissue. Blood vessels are better supported in compact bone and so less liable to passive congestion, but from the narrowness of the canals they are quickly strangulated by the pressure of the exudation, and so the bone is rapidly and completely deprived of vitality. | 1. Most common in cancellous tissue. Here is room for dilatation and exudation without their causing a sudden stasis in the vessels. |
| 2. *Result of Probing.*—A probe is suddenly arrested by striking against hard bone, without giving rise to pain. | 2. It is felt to pass through soft inflamed bone and this is quite sensitive. |
| 3. *Nature of the Discharge.*— Is mostly purulent. | 3. More watery or serous and has a greater amount of lactic acid. |
| 4. *Granulations along the sinus and at its orifice.*—Are comparatively healthy, often fungoús and florid. | 4. Small; or large, pale and edematous. |
| 5. *Cause.*—The more acute, local injury or constitutional, as acute specific fever, the more likely is inflammation to end in necrosis. | 5. In scrofula, caries is most common. |
| 6. *In syphilis.*—Both are frequent. | |

Under the head of hyperostosis we will group cases in which general enlargement of the maxillary bones occurs, without any tumor which could be properly placed among the osteomata. Enlargements of the angles of the inferior maxilla, quite apart from the development of the teeth and giving a peculiarly broad appearance to the face, occur in otherwise healthy subjects of about twenty, and they appear to be stationary. In true hyperostosis, however, there are always large nodules of bone, often symmetrical, thrown out by the bones of the face and cranium, which slowly but steadily increase in size, producing hideous deformity and finally causing death. Heath has operated on some cases where the disease was unilateral, with good success.

Cysts occur in both jaws, either single or multiple. Their origin is probably in the cancelli of the bone, and is in many cases due to irritation caused by neighboring teeth; a cancellous being filled with fluids expands, and produces a gradual absorption and obliteration of neighboring cancelli until a cyst of considerable size is formed.

The multilocular cysts of the inferior maxilla appear to be more closely connected with the teeth than the single cysts, since in many cases the extraction of teeth or stumps gives exit to a quantity of glairy discharge. Distension and absorption of the alveoli go on as the cysts increase in size, so that the walls at length become membranous and the macerated bone shows great gaps in outline. A remarkable point is the length of time over which they may extend without injuring the patient except by inconvenience.

[*To be Continued* ]

# COMMENCEMENTS.

## American College of Dental Surgery.

The eighth annual commencement exercises of the American College of Dental Surgery were held at the Grand Opera House, Chicago, Ills., on Monday, April 2, 1894, at 2:30 o'clock.

The faculty address was delivered by Dr. Edward H. Angle, and the valedictory, "The Elements of Success," by Dr. Alice Menges.

The degree of D.D.S. was conferred on the following graduates by Dr. B. J. Cigrand, President of the Board of Directors:

E. D. Allison.
E. Aiston.
E. H. Bulson.
L. A. Beyer.
C. W. Barlow.
C. W. Blackburn.
Alden Carpenter.
L. A. Colestock.
D. H. Davis.
F. E. Downs.
C. L. Eberts.
Peter Frey.
E. B. Griffin.
S. A. Henry.
Ida N. Harter.
A. G. Hayden.
L. A. Kelley.
E. L. Ketcham.
I. B. Locke.
F. Leggo.
S. E. Lane.
Alice Menges.
A. H. Murdow.
J. F. Mensel.
G. W. Menges.
W. J. Morgan.
J. C. Monzon.
J. C. McDermott.
C. E. Neptune.
B. F. Nichols.
J. T. Perrault.
F. E. Roach.
E. A. Randall.
C. Scheer.
D. E. Smith.
T. M. Smith.
J. Senty.
F. Senty.
H. S. Stevenson.
W. R. Toye.
J. D. VanVleck.
D. M. Willard.
G. W. Wyatt.

Total, 43.

## Royal College of Dental Surgeons of Ontario.

The number of matriculates for the session of 1893-94, at the Royal College of Dental Surgeons of Ontario, Toronto, Canada, was ninety-eight.

No formal commencement was held, but the following students passed the final examination and received the title of L.D.S., and a certificate of license to practice dentistry in Ontario:

Alton Anderson.
C. N. Abbott.
J. W. Bell.
F. E. Beemer.
J. D. Cameron.
M. F. Cross.
Charles Cobban.
Charles Colter.
Donald Davidson.
G. A. Dewar.
W. R. Greene.
H. A. Galloway.
F. G. Hughes.
V. H. Lyon.
A. A. McKenzie.
J. R. Mitchell.
D. Marshall.
J. McKnight.
A. E. McCordick.
G. A. Newton.
B. F. Nicholls.
G. R. Patterson.
R. J. Read.
W. A. Scott.
E. A. Totten.
H. P. Thompson.
W. T. Wood.
F. L. Wood.
A. E. Webster.
All of the Province of Ontario.
Total, 29.

## Ohio College of Dental Surgery.

The forty-eighth annual commencement of the Ohio College of Dental Surgery, Department of Dentistry, University of Cincinnati, was held at the Odeon, Cincinnati, on Tuesday evening, March 27, 1894, at eight o'clock.

The number of matriculates for the session was one hundred and fifty-one.

An address on the "Winning Qualities in Professional Life," was delivered by Rev. Dr. John W. Simpson, President of Marietta College, and the Class Oration by William C. Elifritz, of Springfield, Ohio.

The degree of D.D.S. was conferred on the following persons by F. A. Hunter, D.D.S., of the Board of Trustees.

| NAME. | RESIDENCE. |
|---|---|
| Charles Verey Alsop | Kentucky |
| John Allen Auld | Michigan |
| Edward Grove Barnett | Ohio |
| Charlie Frederick Bauer | Ohio |
| Fred. Ward Brammer | Ohio |
| Daniel Harrison Collette | Ohio |
| Samuel Robert Collier | Kentucky |
| Frank R. Cunningham | California |
| Will DeZoete | Michigan |
| William Charles Elifritz | Ohio |
| Will A. Gregg | Ohio |
| Charles L. Guthrie | Ohio |
| Horace Greeley Hamilton | Ohio |
| George Robert Jenkins | West Virginia |
| Champin Frank Lauderdale | Ohio |
| Lewis Edwin LePage | Ohio |
| William Frederick Lohaas | Ohio |
| Josiah Mann | New York |
| Austin Freeland Merrell | Maine |
| William Franklin Peebles | Ohio |
| Guy Ballard Saxton | Kansas |
| Herman Schwartz | Ohio |
| John Marshall Scott | Ohio |
| David Andrew Smith | Ohio |
| Richard Storey | Minnesota |
| William Jelley Sullivan | Indiana |
| Edward M. Talbot | Iowa |
| Arthur Lincoln Teeters | Ohio |
| Henry Champlain Taylor | Ohio |
| Lawrence Paul Vandervoort | Ohio |
| Thaddeus Selby Ward | Ohio |
| Will Lewis Whipple | Minnesota |
| T. Irving Way | Ohio |
| Herman Henry Zumstein | Ohio |

Total, 34.

## Indiana Dental College.

The fifteenth annual commencement of the Indiana Dental College was held at the Y. M. C. A. Hall, Indianapolis, on Friday evening, March 23, 1894, at eight o'clock.

The number of matriculates for the session was one hundred and four.

The degree of D.D.S. was conferred on the following graduates:

| NAME. | RESIDENCE. |
|---|---|
| DeVolney Bower | Indiana |
| A. E. Boyce | Illinois |
| L. W. Dailey | Indiana |
| J. D. Gage | South Dakota |
| L. Gonzales | Indiana |
| F. M. Hindman | Illinois |
| D. A. House | Ohio |
| A. F. Hubbard. | Ohio |
| W. E. Hutchinson | Indiana |
| F. A. Lange | Indiana |
| Nannie Margason | Illinois |
| P. R. McNeille | New York |
| Maud Neff | Indiana |
| D. H. Oliver, jr | Indiana |
| T. W. Potter | Indiana |
| R. J. Russell | Indiana |
| J. D. Seibert | Michigan |
| S. N. Sellers | Indiana |
| W. L. Spates | California |
| G. J. Staggs | Indiana |
| F. C. Todd | Indiana |
| Charles Whitted. | Indiana |
| I. M. Whittenburg | Illinois |

Total, 23.

◆

## Baltimore College of Dental Surgery.

The fifty-fourth annual commencement exercises of the Baltimore College of Dental Surgery were held at Albaugh's Lyceum Theatre, on Tuesday evening, March 20, 1894, at 8 o'clock.

The annual oration was delivered by the Rev. R. H. Payne, and the valedictory by E. Hoffmeister, Ph.D.

The degree of D.D.S. was conferred on the following graduates by Prof. R. B. Winder, M.D., D.D.S., Dean of the college:

| NAME. | RESIDENCE. |
|---|---|
| Bernard Bar | Maryland |
| Thomas Edw. Black. | N. Carolina |
| Ellery Percival Blanchard | Maine |
| Emmet Jos. Collins | Georgia |
| Robt. Sinclair Corse, jr | Maryland |
| Jas. Horton Cowen | New York |
| Fred'k North Damon | Massachusetts |
| Wm. Preston Davis | Mississippi |
| Caleb Dorsey | Maryland |
| Adelard Jos. Fortier | Rhode Island |
| Wilbert Ennis Foster | Texas |
| Archie Russell Gardner | Montana |
| Thos. Mauck Guier | Maryland |
| Byron Foster Hadley. | Massachusetts |
| Alfred Chas. Hafke, D.D.S | Germany |
| Wm. Sprigg Hamilton | Georgia |
| Fred'k England Hawkesworth. | Canada |
| Edw. Hoffmeister, Ph. D. | Maryland |
| Chas. Hutchinson | Virginia |
| Arthur Jay Kiser | Ohio |
| Louis Klingelhoffer | Ohio |
| G. Herman Kopperl | Texas |
| Chas. Bruce McCue | Maryland |
| Wm. Gaston Mizell, jr | North Carolina |
| Almus Owen | Texas |
| David Burdett Payne. | New York |
| Elton Perry | Texas |
| Wm. Lewis Peters | Massachusetts |
| David Saunders Ray | North Carolina |
| Nicholas Edgar Rierson | N. Carolina |
| Jno. Geo. Schmetzer | South Carolina |
| Geo. Ezra Shattuck | Mississippi |
| Winston Stephens | Florida |
| Geo. Everett Thweatt | Virginia |
| Chas. Richard Twilley | Maryland |
| Wm. Fred'k Walz. | Virginia |
| Dan'l Bitner Williams | Pennsylvania |

Total, 37.

## New York College of Dentistry.

The twenty-eighth annual commencement exercises of the New York College of Dentistry were held in Chickering Hall, New York City, on Tuesday evening, March 13, 1894.

The address to the graduates was delivered by Rev. Percy Stickney Grant, and the valedictory by William G. Beecroft, D.D.S.

The number of matriculates for the session was two hundred and ninety-four.

The degree of D.D.S. was conferred on the following graduates by Professor Frank Abbott, M.D., Dean of the Faculty:

George N. Appleton.
Herbert R. Armstrong.
Charles F. Ash
William G. Beecroft.
Harry M. Bartlett.
James H. Blasdell, jr.
John M. Byers.
Walter H. Colburn.
Louis Cancino, jr.
Thomas C. Cobb.
Percy E. Dowe.
Julius Feiner.
Benjamin Freeman.
Raoul A. Frechette.
Henry Green.
Frederick R. Goddard.
John M. Gillett, M.D.
William C. Gaerste.
Frederick J. Gottlieb.
Charles F. Halpine.
William H. Hopkins.
Marcus C. Hankinson.
Louis H. Hansen.
Joseph H. Holmes.
Oscar A. Krone.
Frank A. Kendall.
Harry O. Logue.
Abram G. Lansing.
James McKenzie, jr.
Timothy H. Murray.
Charles E. Moore.
Vincent P. McLaughlin.
Harry P. Marshall.
Ernest W. Nickerson.
Joseph G. Pease.
Arthur L. Pearson.
William B. Powell.
Joseph Refsum.
Reuben T. Root.
James P. Ruyl.
William H. Rogers.
Joseph E. Smith.
Walter S. Smith.
A. T. Sitterley, jr.
Edward A. Sanford.
David A. Sniffen.
Thomas F. Sweeney.
August Stubenrauch, jr.
Samuel J. Sheckter.
Wilhelm P. Schorn.
Pedro M. Serrano.
Arthur Shorrock.
William A. Swaine.
Albert W. Twiggar.
Timothy C. Tiffany.
Frederick C. Turner.
Hubertus E. Voss.
Edgar E. Woisard.
George W. Watson.
Gerald R. Webster.
Harry A. Woodward.
William Zachman.

Total, 62.

## Philadelphia Dental College.

The thirty-first annual commencement exercises of the Philadelphia Dental College were held in the Chestnut Street Opera House, Philadelphia, Pa., on Thursday, March 8, 1894, at 12 o'clock M.

The number of matriculates for the session was two hundred and ninety-nine.

The address to the graduates was delivered by Prof. S. B. Howell, M.D., D.D.S., and the valedictory by Samuel H. Miller, D.D.S.

The degree of D.D.S. was conferred on the following graduates:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| John C. Amig | Pennsylvania | W. B. Lapham | New York |
| John W. Anderson | Pennsylvania | Will H. Lawrence. | California |
| Harry T. Avery | Pennsylvania | M. J. Lossing | Canada |
| Willard H. Barnes | New York | C. R. McDermott | Massachusetts |
| Nils Berg | Sweden | T. F. Marovici | Roumania |
| Horace H. Bigelow | Nova Scotia | J. T. Marsden | Pennsylvania |
| Godwin M. Brown | North Carolina | Wm. Mason | Canada |
| W. A. Burns, L.D.S., | Canada | Edwin S. Mershon | Pennsylvania |
| Nellie M. Carle | Pennsylvania | S. H. Miller | Pennsylvania |
| M. J. Cogan | Canada | Robert Milligan | Pennsylvania |
| R. W. Collins | Canada | H. P. Moody | British Columbia |
| S. E. A. Daniel | West Indies | Norman H. Myers | Pennsylvania |
| F. E. Davis | Iowa | Homer Palmour | Georgia |
| Robert Lent Davis | Rhode Island | Geo. B. Parker | New York |
| T. H. Dawes | New Jersey | A. E. Preston | New York |
| W. J. Devereaux | Massachusetts | A. D. Quick | New York |
| A. B. Dorland | Michigan | J. Maude Rankin | New York |
| Fred N. Duncan | New Jersey | L. H. Reinhart | Pennsylvania |
| J. J. Eckel | Pennsylvania | Chas. F. Rodbard | Pennsylvania |
| G. W. Filbert, jr., B. S | Pennsylvania | M. E. Rummel | Ohio |
| W. S. Flower | Pennsylvania | M. P. Shoemaker | New Jersey |
| A. J. Foret | Louisiana | W. D. B. Spry | Canada |
| H. H. Forsythe | Canada | C. H. Steele | Texas |
| T. E. Fouser | Illinois | Roger Steib | Louisiana |
| T. W. Gabel | Pennsylvania | J. E. Stevenson | Wisconsin |
| Percy D. Greene | New York | W. F. Sullivan | Alabama |
| E. Greenwood | England | W. A. Taft | New York |
| D. J. Griswold | Illinois | Chas M. Taylor | Pennsylvania |
| N. C. Heaton | Pennsylvania | Otto Tellefsen | Norway |
| Lynn Himel | Louisiana | J. W. Thatcher | Utah |
| A. Hinman, jr | Oregon | G. L. D. Tompkins | New Jersey |
| O. C. Hole | Illinois | J. F. Thomas | Pennsylvania |
| Will Holloway. | Ohio | D. S. Wells | Vermont |
| Frank M. Howard | Pennsylvania | C. E. Wettlaufer | Canada |
| A. A. Humber | British Columbia | Fred. C. Whiting | France |
| P. A. Hymel | Louisiana | H. Putnam Wisely | Canada |
| H. G. Jaquess | Illinois | S. E. Worster | Kansas |
| A. L. Jenkins | Pennsylvania | Martin Zobel | India |
| Chas. E. King | New Jersey | | |

Total, 77.

## University of Maryland—Department of Dental Surgery.

The annual commencement exercises of the Department of Dental Surgery of the University of Maryland were held at the Lyceum Theatre, Baltimore, Friday, March 30, 1894.

The mandamus was read by the Dean, Prof. Ferdinand J. S. Gorgas, M.D., D.D.S.; the address to the graduates was delivered by Rev. Dr. L. T. Townsend, and the class oration by C. Chandler George, Illinois.

The degree of D.D.S. was conferred on the following graduates by Hon. S. Teackle Wallis, LL.D., Provost of the University:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| Frank E. Blakeslee | New York | William P. Lacy | Virginia |
| William M. H. Burfeind | California | William S. Lindsay | South Carolina |
| James C. Chisholm | Alabama | Harter W. March | Ohio |
| Henry Clay Daniel | North Carolina | Charles A. Matthews | Indiana |
| Harry M. Dommett | New York | James T. Montgomery | South Carolina |
| Charles Augustus Davis | Wisconsin | Redorick Morgan | North Carolina |
| Stanton D. Diffenderfer | Pennsylvania | Leander B. Milbourne | Maryland |
| Thomas Dotterer | South Carolina | James A. Proctor | Virginia |
| Baylis D. Earle | South Carolina | William H. Renoe | Missouri |
| Milton S. Fleming | Louisiana | Clarence P. Reynolds | New York |
| H. Eugene Gee | South Carolina | C. Charles Stanley | South Carolina |
| C. Chandler George | Illinois | Norman R. Smithers | Maryland |
| Edward H. Goldberg | Maryland | Fred. B. Smith | Pennsylvania |
| William J. Hartnett | Connecticut | Richard Channing Walden | Virginia |
| John E. M. Heffelbower | Texas | John Eldridge Walton | Georgia |
| Phineas E. Horton | North Carolina | James Watson | Illinois |
| Ambrose H. Huffman | West Virginia | J. Brenton Wise | South Carolina |

Total, 34.

## Cincinnati College of Dental Surgery.

The third annual commencement of the Cincinnati College of Dental Surgery was held at the Sinton Hall, Y. M. C. A. Building, Cincinnati, O., on Monday evening, April 2, 1894, at eight o'clock.

The opening remarks were made by the Dean of the College, and the valedictory address was delivered by Prof. A. V. Phelps, M.D.

The degree of D.D.S. was conferred upon the following graduates by the Dean, G. S. Junkerman, M.D., D.D.S.:

D. R. Anderson.
Chas. E. Apple.
H. R. Hammond.
Wm. P. Murray.
John F. Zinselmeier.

Total, 5.

## Meharry Medical College—Dental Department.

The eighth annual commencement exercises of the Meharry Dental Department of Central Tennessee College, Nashville, Tenn., were held at the Gospel Tabernacle, on Thursday evening, February 8, 1894, in connection with those of the Medical and Pharmaceutical Departments.

The number of matriculates for the session was ten.

The address to the graduating classes was delivered by Bishop J. M. Walden, of Cincinnati, Ohio.

The degree of D.D.S. was conferred on the following graduates by the President, Rev. John Braden, D.D.:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| M. C. Cooper | Texas | A. F. White | Florida |
| G. W. Miller | Tennessee | | |

Total, 3.

## Kansas City Dental College.

The twelfth annual commencement of the Kansas City Dental College was held at Grand Avenue M. E. Church, Kansas City, Missouri, March 5, 1894.

The faculty address was delivered by Alton H. Thompson, D.D.S., Topeka, Kansas, and the valedictory by J. B. Brady, of the graduating class.

The number of matriculates for the session was one hundred and thirteen.

The degree of D.D.S. was conferred on the following graduates by the President of the Faculty, C. B. Hewitt, D.D.S.:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| Eugene Wesley Allendorph | Kansas | Richard Andrew Millen | Missouri |
| Chas. Canning Allen | Kansas | Schuyler Waller Pile | Kansas |
| James Burns Brady | New Mexico | Chas. Nelson Rathbun | Iowa |
| Harry Evert Duncan | Kansas | Geo. Thomas Reily | Missouri |
| John Hockaday Galliher | Missouri | Ellsworth L. Rothrock | Kansas |
| Henry A. Kinnan | Iowa | Archibald Benj. Stote | Kansas |
| Joseph Edgar McKee | Missouri | Abram Thompson | Kansas |
| James Arthur Miller | California | Augustus Morton Wilkes | Kansas |

Total, 16.

## Ohio Medical University—Department of Dentistry.

The second annual commencement of the Dental Department of the Ohio Medical University was held in connection with those of the departments of Medicine and Pharmacy in the Board of Trade Auditorium, Columbus, Ohio, March 13, 1894.

The number of matriculates for the session was twenty-three.

The degree of D.D.S. was conferred on the following graduates:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| J. S. Elder | Ohio | James Whiting | Canada |

Total, 2.

## Western Reserve University—Dental Department.

The first annual commencement exercises of the Dental Department of the Western Reserve University were held February 28, 1894, in the Euclid Avenue Presbyterian Church at Cleveland, Ohio, in connection with the Medical Department, which on that day celebrated its fiftieth anniversary.

Prof. William H. Welch, of Johns Hopkins University, delivered the address; subject "Higher Professional Education."

The number of matriculates for the session was thirty.

The degree of D.D.S. was conferred upon the following graduates by Charles F. Thwing, D.D., President of the University:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| Carl. A. H. Anderson, M.D. | Ohio | J. Frank H. Riggs | Pennsylvania |
| Hugh B. Mitchell | Ohio | G. Otis D'Urfae | Ohio |

Total, 4.

◆

## University of Iowa—Dental Department.

The twelfth annual commencement of the Dental Department of the State University of Iowa was held at the Opera House, Iowa City, Thursday, March 15, 1894, at 7:30 P. M.

The number of matriculates for the session was one hundred and forty-eight.

The annual address was delivered by H. E. Downer, A.B., of Davenport, Iowa.

The degree of D.D.S. was conferred on the following graduates by Charles A. Schaeffer, Ph.D., President of the University:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| G. S. Archer | Iowa | S. L. Ingham | Iowa |
| Maude Baldwin | Wisconsin | W. B. Jayne | Iowa |
| R. W. Baldwin | Wisconsin | H. J. Joy | Iowa |
| O. H. Bemis | Minnesota | W. D. McCabe | Iowa |
| W. G. Bernard | Washington | B. H. McKeeby | Iowa |
| Mallie R. Bowman | Iowa | F. E. Miller | Iowa |
| H. H. Belding | Iowa | E. V. Marsh | South Dakota |
| Chas. W. Bruner | Iowa | W. W. Orebaugh | Iowa |
| M. Clark | Illinois | W. A. Pegg | Pennsylvania |
| H. Daily | Nebraska | J. B. Pherrin | Iowa |
| S. J. Evans | Iowa | M. C. Reno | Iowa |
| E. H. Hollister | Iowa | J. E. Rose | Iowa |
| A. A. Harris | Iowa | J. I. Thompson | Iowa |
| Gard Hicks | Iowa | G. A. Vawter | Illinois |
| L. H. Hinkley | Iowa | W. W. Wold | Minnesota |
| Adel Homer | Iowa | Total, 31. | |

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## The Cleveland University of Medicine and Surgery—Dental Department.

The third annual commencement of the Dental Department of the Cleveland University of Medicine and Surgery was held in connection with that of the Medical Department on Tuesday, March 20, 1894, at Cleveland, O.

The annual address was delivered by Rev. Dr. Levi T. Gilbert.

The degree of D.D.S. was conferred upon the following graduates, viz.:

| NAME. | RESIDENCE. |
|---|---|
| J. G. Colton | Ohio |
| M. E. Fenton | Ohio |
| Fred. A. Herrick | Pennsylvania |
| W. G. Johnson | Ohio |

Total, 4.

## Pennsylvania College of Dental Surgery.

The thirty-eighth annual commencement exercises of the Pennsylvania College of Dental Surgery were held at the Academy of Music, Philadelphia, Pa., on Thursday, March 8, 1894, at 12 o'clock M.

The annual address was delivered by Professor Henry Leffman, M.D., D.D.S.

The number of matriculates for the session was two hundred and seventy-three.

The degree of D.D.S. was conferred on the following graduates by I. Minis Hays, M.D., President of the Board of Corporators:

| NAME. | RESIDENCE. |
|---|---|
| F. R. Adams | New York |
| Martha B. Allaire | New York |
| R. D. Ambrose | Pennsylvania |
| J. S. Anderson | Canada |
| H. W. Bender | Pennsylvania |
| Carl Bischof | Germany |
| C. W. Boyer | Pennsylvania |
| Louis Britton | Pennsylvania |
| A. G. Brown | New York |
| H. W. Burchell | Canada |
| E. E. Clark | Pennsylvania |
| Alex. Cornish | Pennsylvania |
| B. A. Feltwell | Pennsylvania |
| L. H. Fisk | Connecticut |
| R. E. Forster | Pennsylvania |
| L. D. Fisher | Louisiana |
| L. McC. Gibbs | Virginia |
| W. A. Green | Maryland |
| F. L. Grier | Delaware |
| F. A. Hall | Minnesota |
| F. H. Hallen | England |
| Theo. R. Harvey | Pennsylvania |
| H. E. Hager | Pennsylvania |
| Laura K. Hafer | Pennsylvania |
| J. G. Harter | Pennsylvania |
| W. S. Hess | Pennsylvania |
| E. R. Hearn | Pennsylvania |
| Marie J. Hyndman | Pennsylvania |
| A. J. Irwin | Canada |
| A. W. Johnson | New York |
| George C. Knox | Pennsylvania |
| H. B. Littell | Pennsylvania |
| James L. Lord | Pennsylvania |
| Vedder Marcellus | New Jersey |
| W. B. Martin | Pennsylvania |
| J. R. Megraw | Missouri |
| A. B. Miller | Pennsylvania |
| L. M. Monroe | Pennsylvania |
| H. W. Monroe | Pennsylvania |
| W. T. Morton, M.D | Pennsylvania |
| G. B. Murray | Pennsylvania |
| Harvey McAdam | Canada |
| Eugene Pettit | Pennsylvania |
| E. L. Pitcher | New York |
| Rudolph Probst | Switzerland |
| H. W. Reid | New York |
| F. Dell Rhodes | Ohio |
| R. H. Savage | Pennsylvania |
| H. C. Stout | Pennsylvania |
| C. B. Schupack | Pennsylvania |
| Geo. A. Slick | Pennsylvania |
| J. W. Story | Pennsylvania |
| Paul Scheidt | Germany |
| J. Alberto del Solar | Chili |
| E. A. Thayer | Tennessee |
| G. W. Troth | Pennsylvania |
| C. J. Van Horn | Pennsylvania |
| J. Wells Van Valzah | Pennsylvania |
| A. M. Waas | Pennsylvania |
| Alex. Watson | Canada |
| Ira G. Wells | New York |
| B. B. Williamson | New York |

Total, 62.

## Atlanta Dental College.

The first annual commencement exercises of the Atlanta Dental College were held at Atlanta, Ga., on Monday evening, March 5, 1894.

The number of matriculates for the session was one hundred and eighteen.

The valedictory address was delivered by Mortimer Tuttle, D.D.S., and the annual oration by Mr. James W. Austin.

The degree of D.D.S. was conferred on the following graduates by Judge Wm. R. Hammond, President of the Board of Trustees:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| W. F. Austin | South Carolina | S. M. Gunter | South Carolina |
| F. R. Brinson | Georgia | W. B. Jackson | Georgia |
| T. K. Bryan | Virginia | J. C. Jefferds | Georgia |
| O. L. Branch | Georgia | M. A. Jefferds | Georgia |
| C. L. Burrows | Georgia | S. A. King | Texas |
| W. B. Cochran | Georgia | F. G. Lieberman | Georgia |
| J. L. Chapman | Texas | B. C. Murray | Georgia |
| M. D. Cowart | Georgia | R. A. Smith | Georgia |
| D. B. Caswell | Georgia | G. G. Stallworth | Alabama |
| S. B. Corn | Georgia | G. H. Tuttle | Alabama |
| J. P. Doster | Georgia | M. H. Tuttle | Alabama |
| H. A. Durant | South Carolina | C. D. Turner | Georgia |
| E. G. Gilder | Texas | J. M. Whitehead | Georgia |

Total, 26.

## Missouri Dental College.

The twenty-eighth annual commencement exercises of the Missouri Dental College, Dental Department of Washington University, St. Louis, Mo., were held in connection with those of the St. Louis Medical College, on Thursday, March 15, 1894.

The number of matriculates for the session was ninety-four.

The degree of D.D.S. was conferred on the following graduates by W. S. Chaplin, A.M., Chancellor of the University:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| E. F. Becker | Missouri | Dee Morrow | Illinois |
| F. O. Burket | Kansas | G. A. Penney | Illinois |
| O. Conzelman | Missouri | C. W. Purdey | Illinois |
| G. L. Finch | Illinois | M. Robb | Missouri |
| W. F. Hempelman | Missouri | J. Tiffin | Illinois |
| J. B. Kimbrough | Missouri | E. M. Valentine | South Dakota |
| W. J. Lierman | Missouri | J. I. Williams | Illinois |
| R. E. Lockridge | Missouri | M. R. Windhorst | Missouri |
| C. E. McIlwain | Illinois | G. W. Wommack | Missouri |
| H. W. Miles | Nebraska | R. B. Young | Missouri |
| J. S. Morrison | Illinois | | |

Total, 21.

## Western Dental College.

The fourth annual commencement exercises of the Western Dental College were held at the Auditorium, Kansas City, Mo., on Tuesday evening, March 6, 1894.

The annual address was delivered by Rev. C. C. Woods, the address on behalf of the faculty by Dr. Jabez N. Jackson, and the valedictory address by J. J. Moore, D.D.S.

The number of matriculates for the session was one hundred and twenty-six.

The degree of D.D.S. was conferred on the following graduates by Dr. D. J. McMillen, Dean of the College:

| NAME. | RESIDENCE. |
|---|---|
| M. E. Bryan | Missouri |
| Frank O. Boyd | Kansas |
| R. M. Ball | Missouri |
| E. E. Buckle | Illinois |
| R. M. Bell | Missouri |
| J. B. Douglas | Missouri |
| E. B. Downing | Missouri |
| C. P. Fyler | Kansas |
| J. R. Gaines | Missouri |
| E. E. Hawley | Missouri |
| J. D. Houston | Nebraska |
| C. I. Irwin | Missouri |
| John C. Kerner | Missouri |
| Harry McMillen | Missouri |
| W. Magruder | Missouri |
| J. J. Moore | Kansas |
| H. F. Palenski | Kansas |
| W. H. Pfahler | Missouri |
| H. C. Rush | Kansas |
| C. A. Stuerwald | Iowa |
| B. C. Smith | Missouri |
| H. F. Sidney | Kansas |
| Lovell Shockey | Missouri |
| O. E. Tibbitts | Illinois |
| H. C. Thornton | Missouri |
| Frank Wild | Missouri |

Total, 26.

## University of Denver—Dental Department.

The sixth annual commencement exercises of the Dental Department of the University of Denver were held in connection with those of the Medical and Pharmaceutical Departments, on Tuesday evening, April 17, 1894.

The number of matriculates for the session was eighteen.

Addresses were delivered by Robert McIntyre, Professors Howell T. Pershing, Joseph A. Sewall and J. M. Norman.

The degree of D.D.S. was conferred by Chancellor McDowell on the following graduates:

Orlando Walter Brown.
Herschel David Raub.
Arthur Ward Saner.

Total, 3.

## Vanderbilt University—Dental Department.

The fifteenth annual commencement exercises of the Dental Department of this School were held in the University Chapel, Nashville, Tenn., on Wednesday, February 28, 1894.

The charge to the class was delivered by Professor W. H. Morgan, and the valedictory by A. S. Robertson, of Louisiana.

The number of matriculates for the session was one hundred and twenty-nine.

The degree of D.D.S. was conferred on the following graduates by the Chancellor, J. H. Kirkland:

| NAME. | RESIDENCE. |
|---|---|
| J. S. Betts | South Carolina |
| A. Blomstine | Tennessee |
| W. W. Cross | California |
| T. E. Crosley | Alabama |
| C. E. Donnell | Missouri |
| Wm. W. Earhart | Tennessee |
| T. E. Green | Alabama |
| S. J. Gordon | Alabama |
| E. O. Hopps | Florida |
| A. J. Hagen | Tennessee |
| J. C. Haines | Illinois |
| R. E. Milburne | Ohio |
| L. Leslie | Illinois |
| G. T. Penny | Missouri |
| T. B. Ragin | Illinois |
| A. S. Robertson | Louisiana |
| W. E. Rush | Alabama |
| I. F. Scott | Mississippi |
| H. M. Stryker | Illinois |
| E. F. Thames | Alabama |
| N. N. Vann | Alabama |
| H. S. Vaughn | Tennessee |
| Wm. W. Walker | Canada |
| F. W. Wallace | Mississippi |
| D. E. Whitby | Alabama |

Total, 25.

## Illnesses Ascribed to Dentition.

In the course of five years the author saw 734 sick children, and among these 72 who were cutting teeth. In seven cases he believed a direct connection between the illness and the teething could be traced, but in these cases the disturbance was very slight, consisting of restlessness and crying, evidently caused by the pain. Generally the gums were found to be red and swollen. Fever was present in none of the cases.

(This further emphasizes the recent position that severe symptoms during dentition can almost invariably be found to be caused by other disturbances than the mere physiological eruption of the teeth.—Ed.)—*Dr. Sejournet* (*Rev. Mens. des Mal. del'Enfance*, 1893; XI; 3), *in the American Medica-Surgical Bulletin.*

# SELECTIONS.

## Root-Filling.

BY HARRY BALDWIN, M.R.C S., L.D.S., ENG.

Read before the Odontological Society of Great Britain.

The question which arises at the outset, in the consideration of the advisability of immediate root-filling, is as to the nature of the objection which is raised against it.

The objection commonly urged against it, is that pericementitis in some form is more likely to ensue, or become uncontrollable, after immediate root-filling, than after root-filling which has been preceded by previous treatment.

In order, then, to pave the way it seems necessary to state the nature of this pericemental inflammation, and the manner in which its causes come into operation. Everything seems to show that the pericementum primarily becomes inflamed by absorption of some of the products of putrefaction, and some of the micro-organisms which cause putrefaction, both of which previously lodged within the pulp canal; and that it may be kept up by the micro-organisms thus absorbed living and proliferating within the pericementum, and thus supplying fresh quantities of toxic material. For this absorption primarily to take place, it seems to be necessary that these putrid products and organisms should come into actual contact with the pericementum at the apical foramen. Virulently putrid material may be lodged in the pulp-canal without any irritation of the pericementum, provided that it remains entirely within the canal, but if any force intervenes which displaces some of this material out of the end of the root into contact with the pericementum, inoculation may be effected, and inflammation set up. There is nothing to support the idea that the pericementum can ordinarily be infected through the substance of the dentine and cementum; in fact, the channels which unite the dentinal tubules with the canaliculi of the cementum are so exceedingly minute that the tooth substance may here be regarded as a solid wall, effectually barring the progress of irritant matter, excepting in those rare cases where pathologically large channels run transversely between the pulp-canal and pericementum.

It might be objected here that if this theory were all sound, it would be always safe to fill a tooth with putrid pulp-canals at once, without removing the putrid contents, provided no force were used which could displace any of the putrid material into contact with the pericementum. This treatment we know is unsuccessful in practice. The inflammation which follows is probably to be explained, not so much by pressure of malodorous gas upon the pericementum—though the gas would inevitably collect under pressure—but by some of the putrid material being forced into contact with the pericementum by the pressure of this gas. This seems especially likely when we consider that the gas would be generated throughout the mass of the putrid material, and chiefly at the end of the root farthest from the apex, where the putrescent material would be in greater quantity, and the gas from which would be in a better position to project a quantity of the poison against the membrane.

Now, as to the claims of immediate-root-filling.

### ITS ADVANTAGES.

1. It is obviously a great advantage to both patient and operator to be able to immediately permanently fill a root with the certainty of success, in the case of patients who cannot give another sitting.

2. It is obviously a saving of time, as there is but one fixing of rubber-dam, and there is no time lost in placing and removing unnecessary dressings.

3. It is an advantage to plug the apical foramen as soon as safe to do so, as the pericementum is thereby safe-guarded from sundry forms of irritation, not the least of which are sundry pricks inflicted upon it by nerve bristles, and again, the alterations of tension, which the insertion and removal of wet wisps of cotton wool inevitably produce when they fit the channel more or less tightly, as they generally do, and so act as a piston.

4. In addition are the collateral advantages of inspiring a perfection of manipulation and a thoroughness of procedure, which are of great value. It is only by very delicate and thorough treatment, with regard to the removal of putrid material, the avoidance of displacing any through the apical foramen, and the gaining of thorough and direct access as far as possible to all parts of the canal, that success is at all likely to be attained.

### ITS DISADVANTAGES.

Provided there is perfect safety in it, there are no disadvantages in immediate-root-filling.

The advantages, however, are considerably lessened by the facts that its perfect safety is in all cases doubtful, unfortunately, and that there is usually an insufficiency of time during a first sitting to carry through all the processes of opening up, cleansing, and filling the cavity of the pulp-canal and the cavity of decay, and again by the facts that a trial dressing takes up but a very little extra time, provided the patient has to come again, and that if followed by serious inflammation, the consequences of immediate-root-fillings are very sad.

It may be noted here that if, as usually happens on a first visit, there is an insufficiency of time to carry through all the processes incidental to the treatment of a dead and putrid tooth, it is advantageous that all the preparation should be done on the first day, and all the filling on the next, if no inflammation of a threatening character has intervened, as by this means the tooth is tested, and very often one thorough drying and application of the rubber-dam suffices, viz., that which has to be done for the fillings.

Now an enumeration of the *dangers* of immediate root-filling.

1. When introducing a nerve-extractor or nerve-canal drill into a root which contains putrid fluid, it is exceedingly likely that the tension so produced will displace some of the putrid fluid into contact with the pericementum, or even quite through the apical foramen. The immediately subsequent attempt at disinfection may fail to neutralize the activity of this poison, and a painful inflammation may be set up, which, if the canal is irre-

movably filled, cannot be directly treated nor pressure relieved; while the converse is the case if the root-filling admit of easy removal. The danger in this direction would probably be greater in the case of those teeth which were affected by incipient pericementitis at the outset of the treatment, as here the membrane would be of lowered resistance and more prone to become acutely inflamed.

2. When roots are causing abscess without "fistulous" opening there may be a considerable potential cavity in the jaw, eroded by the ulcerative process of the abscess. In many cases it will be impossible to thoroughly sterilize and evacuate this cavity by one operation, and then immediate-root-filling will result in an aggravation of the symptoms, if, indeed, any symptoms previously existed.

Again, supposing that an abscess cavity can be sterilized, but that it remains full of pus when the root is filled, then the best that can happen is that the pus may become inspissated, and represented by a cheesy mass. Mr. Lawson in a clinical lecture, was once very emphatic in declaring that in his opinion not one drop of pus in this world had ever been absorbed, but all cases of seeming absorption of pus were really cases of inspissation. It may be argued that there is no objection to a cheesy mass, but this is not so, as inflammatory changes are more likely to ensue in after-time in the neighborhood of such a dead deposit than at a spot more normally conditioned.

In the opposite method of treatment, viz., the treatment by dressings, the pulp-canal is left open to drain, and antiseptics are introduced at intervals into the canal, and, if possible, pumped through into the potential cavity. Thus the potential cavity becomes more or less rapidly obliterated by the general shrinking together of the inflamed and expanded tissues, if the case be acute, or by the formation of granulation tissue if the case be chronic. In all other parts of the body this is the accredited and most generally successful method of treating abscesses, viz., to combine drainage with disinfection, and so insure the cavity healing up from its base. Thus it is seen that where there is practically an alveolar abscess-cavity in the bone, immediate-root-filling runs counter to all the ordinary acceptations of surgical theory and practice.

Now as to general rules. In every case the canals should be opened up thoroughly and vertically, preferably with German screw-cut burs for the crown, and conical burs for the canals, until instruments can be readily introduced into all the canals without bending.

A good filling for pulp-canals should be solid, unirritating, antiseptic, and removable, and should fill up the whole length of the canal. For reasonably safe roots I prefer as a root-filling a stiff solution in chloroform of gutta-percha and hydronaphthol, plus a sufficiency of cotton-wool fibre to carry it into place, and gutta-percha points where the canals are large. This is easy, penetrating, antiseptic, non-irritating, permanent, solid, and can always be removed with a blunt-pointed nerve-canal drill.

For canals which are not considered very safe ones, or which cannot be followed far owing to curvature of the roots, I recommend a root-filling of a mixture of hydro-napthol, eucalyptus oil, and French chalk on a wisp of cotton-wool. This mixture sets into a crystalline mass, but at the temperature of the body is not too stiff to prevent its being drawn clear away from the canal at will. It is highly antiseptic, and quite unirritating. In a bottle it becomes hard, and has to be melted by heat before it can be used, but when melted remains fluid for a convenient length of time.

### CLASSIFICATION OF ROOTS FOR ROOT FILLING.

1. *Aseptic Roots.*—Those which have never contained putrid material (as where the nerves have recently been killed with arsenic, or have recently died from acute inflammation).

2. *Septic Roots without complications (gumboil or abscess; gumboil signifying "sinus").*

3. *Septic Roots without gumboil but with abscess.*

4. *Sceptic Roots with gumboil.*

1. *Aseptic Roots.*—These should be filled as soon as the nerves are thoroughly out, bleeding ceased, and the canals clean, provided there is no arsenic-irritation. If there be, the canal should be left freely open to the saliva until all tenderness has passed away.

2. *Septic Roots without complications.*—First remove any solid particles of decomposing nerve, or other solid matter from the canal by means of a fine new barbed nerve extractor, introducing it little by little, and meanwhile frequently with-drawing it, and cleaning away from it any engaged particles. This is to prevent, as far as possible, any pumping caused by driving up any piece of solid matter. Then thoroughly dry out with numerous wisps of dry cotton on fine bristles all the fluid contents of the canal. This is emphatically important and should be thoroughly done before any fluid antiseptic is introduced into the canal, as removing the most efficient cause of inflammation. Next, pass a fluid antiseptic, as far as possible, along the canal on a fine wisp of cotton. The antiseptic recommended is mercuric perchloride in alcohol (1 in 1000), or pure carbolic acid. Next, except in the case of unusually large canals, carefully drill out the whole length as far as possible with sterilized probe-pointed Gates' drills, only advancing along the terminal part of the root with a very fine drill, and always avoiding excessively big drills. When using these drills always keep the engine running fast, and press them only gently; never let the engine stop while the drill is in the canal. Now must be decided the question of whether the canals shall be immediately filled. In most cases it would, no doubt, be safe to do so, but in the absence of strong reasons to the contrary, I should put a loose dressing of eucalyptus-oil into the canals, and a temporary cotton and sandarac stopping into the cavity of the crown, reserving the filling of both roots and cavity till another and generally more convenient day, and instructing the patient to take out the temporary stopping if tenderness should occur. On the next occasion, if no serious inflammation be present, and the temporary stopping be still *in situ*, fill the roots and finish the tooth. If the patient were obliged to remove the temporary stopping through tenderness occurring, dress antiseptically again, and renew the temporary stopping, and so continue until the temporary stopping can be retained without discomfort.

3. *Septic Roots without gumboil but with abscess.*—If an abscess be pointing on the gum, open it with a lancet and so convert the

case into one with gumboil. When the abscess cannot be opened externally, treatment is often restricted on the first day, with advantage, to merely making a drill-hole or opening into the pulp-canal, and so evacuating pus and relieving tension. When the tenderness is not excessive, open up the canals thoroughly, free them completely from debris, disinfect them well, and if pus is freely forming, leave them open to drain, instructing the patient to merely place cotton dipped in say, camphorated spirit, loose into the cavity during meals, and to take it quite out during the intervals, and to frequently suck the tooth so as to aspirate the pulp-canal.

If the pus is not forming freely, absorb it all as far as possible with dry wisps of cotton or bristles, then well pump an antiseptic (as creasote) along the canal and proceed in the tentative way described above. Do not fill the root till a temporary stopping has been retained tightly in place for, preferably, as long as a week. Do not use gutta percha as a temporary stopping where the patient cannot remove it.

4. *Septic Roots with gumboil.*—A gumboil being a sinus leading from a putrid pulp-canal provides escape for inflammatory exudation, and therefore would prevent any immediate trouble on immediately filling the root, but in order to ensure the healing up of any suppurating cavity which may exist in the jaw, it is better to proceed as follows: Well open up the cavity of the pulp chamber, rake out the contents of the canals, insert into each canal a loose wisp of cotton dipped in creasote or convey creasote into the cavity, if it be in a lower tooth, by means of conveying forceps. If the blades of the forceps be held together and dipped in fluid, they will hold a good quantity of it like a geometric pen, and will drop it when the blades are allowed to separate. Having filled the canals and pulp cavity with the antiseptic, place a round ball of soft unvulcanized rubber in the cavity, then squeeze the rubber in with the largest ended instrument which can be used until the creasote forces out the contents of the sinus and finally issues itself freely through the gumboil. Repeat this process at intervals of several days until the creasote will no longer pass through, penetrating the gumboil with a probe to

break open any superficial healing over; then permanently fill the roots.

In very long-standing cases there is a large abscess cavity in the jaw, as proved by probing through the gumboil with a silver probe, the roots may as well be filled immediately. Enlarge the orifice of the gumboil with nitric acid, syringe out the cavity through the hole in the gum with an antiseptic and put in a drainage tube, either of small soft rubber tubing or of gutta percha tissue rolled into the form of a tube. Cut plenty of holes in the sides of the tube. Repeat the syringing at intervals of several days, removing the tube each time and shortening it as the cavity fills up. If it finally refuses to close and the end or ends of the root or roots remain isolated and bare, amputate them with a screw-cut fissure bur.

While the foregoing remarks will be seen to discourage absolute immediate-root-filling, they will be seen to encourage the adoption of all the care and thoroughness of treatment which has been so strenuously advocated by the advanced immediate-root-fillers, and it behooves one to acknowledge fully that their labors and arguments have been of immense service to dental art and science, and though not blindly to be followed in the treatment of every individual case, they have been the means of considerably increasing the general success of root-filling, and shortening the treatment of dead teeth all round. First and foremost among those to whom we are beholden for introducing this new departure into this country, and urging its claims, is George Cunningham, M.A. He has here scored a conspicuous success, viewing the matter broadly.

Before the advent of the immediate root-fillers, dead teeth were approached more or less with fear and trembling, and their treatment was protracted over many weary and unremunerative visits, the very idea of immediate root-filling being looked upon as an absurdity. Now dead teeth have lost most of their terrors and treachery, are approached with a confident feeling, and the number of visits devoted to their treatment may generally be reduced to two.

It is now clear that the main things desirable are to thoroughly and bodily remove all the putrid material from the root without causing inoculation of the pericementum, to disinfect the canal with some potent antiseptic, and to fill it with something permanent and solid; and I think it can be added that in the interest of the patient it is better to wait till the root has had a trial-filling before proceeding to the final stage of the operation.—*British Journal of Dental Science.*

# NOTICES.

## Program for Dental Section of American Medical Association.

Address, by Dr. M. H. Fletcher.

"Professional Ethics," by Dr. Van Orden.

"The Lateral Incisor," by Dr. C. L. Goddard.

"The Teeth of our School Children—What Shall be Done to Save Them?" by Dr. J. C. McCoy.

"Pyorrhœa Alveolaris, What it is and What the Dentist can do for it," by Dr. L. L. Dunbar.

"Pyorrhœa Alveolaris," by Dr. W. J. Younger.

"Remote Effects of Oral Lesions," Dr. W. B. Sherman.

"The Systemic Factor in the Treatment of Dental Caries," by Dr. G. S. Dean.

"The Present and Future Status of the Dental Practitioner," by Dr. J. D. Hodgen.

"Operations on Congenital Cleft Palate," by Dr. Robert McLain.

"Random Thoughts on our Specialty," by Dr. A. E. Baldwin.

"Pathological Notes on Neoplasms of the Maxillæ with Cases and Photographs," by Dr. Vida A. Latham, F.R.M.S., D.D.S.

"The Present Scientific Status of Hypnotism," by Dr. W. X. Sudduth.

Dr. E. S. Talbot.———

Dr. J. Taft.———

DR. M. H. FLETCHER, Cincinnati, O., Chairman.

DR. E. S. TALBOT, Chicago, Ill., Secretary.

## Chicago Dental Society.

At the annual meeting of the Chicago Dental Society, held in Kindergarten Hall, April 3, 1894, the following officers were duly elected for the ensuing year :

J. H. Woolley, President ; C. E. Bentley, 1st. Vice-President; D. M. Gallie, 2d. Vice-President ; A. H. Peck, Recording Secretary ; H. A. Costner, Corresponding Secretary ; E. D. Swain, Treasurer ; J. J. Whaley, Librarian ; J. M. Crouse, Director.

Yours truly,
H A. COSTNER, Cor. Sec.

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## The Midwinter Fair, San Francisco.

The Midwinter Fair Dental Congress, will be held at San Francisco, Cal., June next from the 11th to 15th inclusive.

All the reputable legal dentists of the nine States and Territories of the Pacific slope, together with those east of the Rockies, who wish to join with us, are expected, and urgently requested to attend this meeting, bringing with them any and everything that may be of interest to the profession.

Come prepared to give rather than to take.

Interesting papers and clinics are promised from leading men both East and West.

A meeting is anticipated that will be second only to that held at Chicago last August.

The work is being carried forward by the following officers and chairmen of committees :

President—Luther A. Teague, 10 Geary street, San Francisco.

Vice-Presidents—S. E. Knowles, 139 Post street, S. F.; J. A. W. Lundborg, 219 Geary street, S. F.

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C. E. Post, Cor. Sec.

## The Dental Society of the State of New York.

The twenty-sixth annual meeting of the Dental Society of the State of New York will be held in the Lecture Room of the Young Men's Christian Association Building, Albany, N. Y., on Wednesday and Thursday, May 9 and 10, 1894.

The following interesting programme has been arranged for this occasion:

President's Annual Address, F. T. Van Woert, M.D.S., Brooklyn.

"Crown and Bridge-Work—a Protest Against Some of Its Abuses," S. H Guilford, D.D.S., Ph.D., Philadelphia.

"Can Pyorrhœa be Cured?" J. Allen Osmun, M.D.S., Newark, N. J.

"The Sixth-Year Molars," R. M. Sanger, D.D.S., East Orange, N. J.

"The Use of Peroxide of Sodium, as recommended by Dr. E. C. Kirk," W. J. Turner, M.D., D.D.S., Brooklyn.

"Green Stain in its Relation to Decalcification of Enamel," R. Ottolengui, M.D.S.

Dentists who are not members of the Society are cordially invited to be present and to participate in the discussions of the meeting; and the members are particularly requested to come prepared to assist in making the meeting one of unusual interest.

## The Texas State Dental Association.

The Annual Meeting of the Texas State Dental Association will be held in San Antonia, May 15, 1894.

A. A. Beville, President.
Chas. B. Lewis, Secretary.

# CORRESPONDENCE.

Bay St. Louis, Miss., April 7, 1894.

*Editor Dental Register:*

At the annual meeting of the Mississippi State Board of Dental Examiners, April 3, 4, 5, there were thirteen applicants, the successful candidates being J. R. Moore, W. P. Davis, W. O. Talbert, A. B. Kelly, A. T. Pierce and J. E. Johnson.

The system of the Illinois State Board, as recently published in the *Dental Review,* was adopted and worked very acceptably. No oral examinations were held, however, additional lists of questions being prepared on Oral Surgery, Prosthesis and Orthodontia. Each applicant who passed the written examination successfully was also required to clinic—the first time that this has been attempted by the Mississippi Board.

To secure the removal from the Board of A. H. Hilzem, a man who persisted in advertising contrary to the code of ethics (and who for this reason is no longer a member of the State Association) but who refused to resign from the Board, and whom the Governor declined to remove—but who consented to resign with the Board in a body—the entire Board resigned, each one pledging himself not to accept a re-appointment from the present Governor. This step was thought preferable to allowing a man setting such an evil example to the younger members of the profession, to occupy such a prominent position as that of member of the Board of Dental Examiners.

W. E. Walker, President.
Geo. B. Clement, Secretary.

# EDITORIAL.

## Bibliographical.

ETIOLOGY OF OSSEOUS DEFORMITIES OF THE HEAD, FACE, JAWS, AND TEETH. By Eugene S. Talbot, M.D., D.D.S., Author of "Irregularities of the Teeth, and their Treatment." Author of "Chart of Typical Forms of Constitutional Irregularities of the Teeth," etc., etc. Third Edition, Revised and Enlarged with 461 Illustrations, 422 of which are original. This Work just issued from the Press of The W. T. Keener Company, Chicago.

This is a most valuable work; the outcome of years of study and patient investigation. In its preparation the Author has used not only that which he could gain by his own assiduous persevering effort in years of study and investigation, but he has received the aid and co-operation of others who have been engaged in the same line of work for a long period of time. It covers a broad field and is embraced in thirty-nine chapters, in which are presented almost every phase of the great subject with which it deals. It begins with a Historical Sketch of Theories Regarding the Etiology of Irregularities of the Maxillæ and Teeth; Changes in Climate; Intermixture of Races; Hereditary Influence; Development of the Cranium and Face; Development of the Jaws; Development of the Vault; Development of the Alveolar Process; Developmental Neuroses; Neurotics; Genius; Idiocy; Consanguinity of Parents; Intemperance; Maternal Impressions; City versus Country Life, etc., etc. These and other subjects are presented in a very clear and forcible manner. It is a work that may be studied with very great profit, not only by the dental practitioner and student, but by the physician and surgeon as well. We know of no other source where the same information may be so compactly detailed and clearly presented for the general student.

The illustrations, the larger proportion of which are original, are finely executed, and clearly present the points for which they were intended. We can not here attempt to give a review or criticism of the work, but simply desire with emphasis to call attention to its great value and many excellencies for the student in this line of investigation. We advise all our professional brethren to secure the work, and each one thoroughly review and criticise if need be for himself.

## Necrology.

Died at Ann Arbor, Mich., April 14, 1894, of an attack of apoplexy, Dr. Corydon L. Ford, M.D., in the 81st year of his age.

He had for the last few months been in more than usual good health. On the 13th about midday, he started from the Dental College to his home, and while on the way without any premonition he was stricken down; was removed to his home, and died the next morning. He had delivered the last lecture of his course for this year to the medical students the day before the attack. It was remarked by those who heard him that he seemed to have the vigor and energy of younger days. This completed his fortieth year of work in the Medical Department of the University of Michigan. His work here, however, was only a part of the work of his professional life. He began his work as teacher of anatomy in the Medical College at Geneva, New York, in 1842, immediately after his graduation.

During his course of medical study he was a pupil of Dr. E. Carr, of Canandaigua, in the study of dentistry. In this he soon attained such proficiency as enabled him to combine dentistry with such general practice as his health enabled him to engage in, while not on duty as demonstrator of anatomy.

January 25th, 1842, he took his medical degree. He had developed such a taste and aptitude for anatomic pursuits that on the day of his graduation he was appointed Demonstrator of Anatomy in the college at Geneva. He occupied this position till January 1849. In 1846 Buffalo Medical College was organized, when he was called to be Demonstrator of Anatomy in that institution. There he served for three years, when he was appointed Professor of Anatomy in Castleton Medical College, Vermont, where he continued to lecture till 1862. The honorary degree of A.M., was conferred upon him by Middlebury College in 1856.

In 1854 he was appointed Professor of Anatomy in the University of Michigan, where he has continued his annual course of lectures on anatomy and physiology for forty years. In 1860 he was appointed Professor of Anatomy in Berkshire Medical College, Pittsfield, Mass., where he lectured for several years, at the period of the year when the University of Michigan was not in session. In 1864 he accepted the Chair of Anatomy in the Medical School of Maine, Bowdoin College at Brunswick; this position he held till 1870, when he took a recess from his labors in Europe. After which he was appointed to the Chair of Anatomy in Long Island College, Hospital Medical School, Brooklyn,N.Y., which position he held for nineteen years. These courses were given in the intervals of his work in the University of Michigan. Thus it is quite apparent that Dr. Ford's life has been an exceedingly busy one He has delivered on his favorite subject one hundred and nine courses of lectures. During the last third of a century he has been considered one of the best authorities on anatomy in this country. The whole period of his work as teacher of anatomy has occupied fifty-two years, and with unsurpassed success from the beginning to the end; a career very exceptional indeed. Of him it is said, that no man in this country at least has taught anatomy to a greater number of students, and no one in any country has taught better or more faithfully, and inspired more enthusiasm.

In 1878 he was made a member of the Faculty of the Dental Department of the University of Michigan, and has given special instruction to dental students, dwelling at greater length and with more minutiæ on topics that more directly concerned the dental practitioner than any other teacher. In aid of this work, he has prepared questions on anatomy and physiology of the teeth and associated parts for dental students. With a view of awakening an interest in a subject closely allied to the work of the dentist he prepared a syllabus of lectures and questions on Odontology—human and comparative—for the Dental Student.

In 1881 the University of Michigan conferred upon him the title of LL.D. During the years 1852-3, and 1853-4, Dr. Ford was connected with the New York College of Dentistry, at Syracuse, gave instructions in anatomy in that institution, where he received the title of D.D.S. This connection was severed upon his appointment to the University of Michigan in 1854.

Such a life is grand and glorious, full of active, useful work, from the beginning to the end of its career. We can now recall the name of no one in this country who has excelled or even equalled Dr. Ford in all the great work he has accomplished. An almost innumerable host of the medical profession are ready to rise and call him blessed; and may they all seek to emulate the noble example which he has left for them.

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Died, at seven o'clock Sunday evening, April 22, at his home in Lexington, Ky., Dr. A. O. Rawls.

The doctor having been indisposed for a time, for relief took chloral, and in such quantity as to produce fatal result. This is a great surprise to all the members of the profession who knew him.

Dr. Rawls was born at Wilmington, Ohio, December 8, 1841. He began the study of dental surgery with Dr. John Doughty, of Connersville, Ind., in 1858. His pupilage continued for two years, when he entered the service of his country, in the Third Indiana Artillery, in June 1861. He served three years, then went to Missouri with Fremont and Hunter, was in Bank's Red River campaign. He went early in 1864 with Sherman to Meridian, Miss., and Selma, Ala. During the latter part of this year he returned to Connersville, resumed the practice of dentistry, remaining till 1872. He was a graduate of the Ohio College of Dental Surgery in 1870. A few years after his graduation he was connected with his Alma Mater as a teacher, and manifested rare ability in that work. In 1872 he practiced in San Francisco and Chicago. In January, 1873, he moved to Lexington, where he practiced up to the time of his death with great success.

Dr. Rawls possessed a very high sense of honor and maintained in a marked degree the dignity of his chosen profession. His attachments when formed were very strong, and his friendship, when fixed, was absolutely reliable. He was an earnest student on several lines of his profession and made very high attainments. His family will have the warmest sympathy of his numerous professional friends throughout the country.

The following action was taken by the profession of Lexington :

WHEREAS, Death has taken from our midst, in the full prime of life and usefulness, a talented and exemplary member of our profession, Dr. A. O. Rawls, whose career was crowded with vicissitudes; but whether as soldier, battling for his country's existence; student, preparing for the battle of life; professor, teaching others to be self-sustaining, or practitioner in his honorable calling, he was always a man of honor and probity, carrying himself so as to gain the respect of his comrades at arms and his brothers of the dental profession, and the esteem and good will of all who had the pleasure of his acquaintance. He was a charter member of the Kentucky Dental Association, of which he was twice elected president, and was a member of the State Board of Dental Examiners; for years was president of the Mississippi Valley and also Southern Dental Associations, and in the American Dental Association he was honored with office. In the presence of so sad a death it is meet that members of the dental profession in the city of Lexington take some formal action betokening their unaffected sorrow at the loss which they have sustained.

*Resolved*, By the dental surgeons here present that we deeply deplore the death of Dr. Albert O. Rawls, regarding it as a personal as well as a professional loss to us as well as to his large clientage and incidentally to the community. He was a valued citizen, and as a friend was faithful and true, a devoted husband, and indulgent father. He worked faithfully in his chosen field and his labors were crowned with success. To the younger members of his profession his course will serve as a stimulant to them to strive to reach the highest standard of excellence. He understood the demands upon him as a practitioner and citizen and responded fully to the requirements in every respect.

*Resolved*, That we tender to the bereaved family of the deceased our heartfelt sympathy in their present grief and that a copy of these resolutions be presented to them and also published in the city papers and dental journals.

Dr. T. D. Kelley, Chairman.
Dr H. L. Harlan, Secretary.

## William Henry Eames, D.D.S.

Dr. William Henry Eames died in St. Louis, at the residence of his daughter, Dr. Emma Eames-Chase, on March 29, after a short illness.

He was born in Auburn, N. Y., August 23, 1828. His father, George Eames, soon after the birth of this son, removed to Oneida county, N. Y., where his father, James Eames, with his large family had settled in 1794. They were progressive people, taking an active part in all public affairs, and particularly interested in educational advancement. The active interest, untiring zeal and devotion with which Dr. Eames labored for the advancement of his profession, in the college, in the journals, and in societies was a direct continuation of the spirit with which his father and grandfather before him had worked for the intellectual advancement of the rising generation. He was educated in the public schools and at the Clinton Academy, in Oneida county. After teaching school several years he commenced the study of medicine with Dr. Porter, an eminent English physician, and went to Ann Arbor to complete his medical studies at the University of Michigan. While there he decided to study dentistry, and entered the Ohio College of Dental Surgery, graduating in 1583. He returned to Ann Arbor and formed a partnership with his preceptor, Dr. Porter.

He was married in 1855 to Laura M. Scofield, of Clinton, Michigan, and removed to Lebanon, Tenn., in 1857, remaining there until 1862, when, owing to the disturbed condition of the south, he removed to St. Louis, Mo. He at once became a member of the St. Louis Dental Society, and always took an active and prominent part in the profession in St. Louis. It was at a meeting of the Society at his residence that the subject of organizing a dental college in St. Louis was introduced. There were present at this meeting Drs. Judd, McKellops, Forbes, Peebles and others, and from its first inception he was an active worker, continuing through many years to the very night before he was stricken down. He was one of the founders of the *Missouri Dental Journal,* and for many years its editor; and later, editor of the *Archives of Dentistry*, which succeeded it.

Dr. Eames was an active member of the American Dental Association, the Missouri State Dental Association, and the St. Louis Dental Society; the last two of which he has been President at different times. He had also served as President of the Association of Dental College Faculties, and was an honorary member of the Illinois, Iowa, and other State and district dental societies.

It is not necessary to speak here of the genial nature and the many admirable qualities of our departed brother; these are known to all who ever had the pleasure of his acquaintance, and will be referred to as pleasant recollections until all have followed him to the other side.

The doctor leaves a wife and seven grown children; two sons and five daughters.—*The Dental Review.* A. H. FULLER.

### RESOLUTIONS OF RESPECT.

The following resolutions on the death of Prof. W. H. Eames, of St. Louis, were adopted at the regular meeting of the Chicago Dental Society, April 3, 1894.

WHEREAS: It has come to the knowledge of the members of the Chicago Dental Society that the dental profession is called to mourn the loss of one of its most distinguished and honored members;

*Therefore be it resolved,* That, in the decease of Prof. Eames, the world has lost one of its foremost educators, his family a devoted husband and father, and the profession a sincere earnest and useful devotee. It is fitting that this society should pay its tribute of respect to one who has so long and honorably filled positions before the world, and we mourn his death as a personal loss to each and all of us.

*Be it further resolved,* That a copy of the above be transmitted to the family of the deceased, and a further copy be sent to the journals for publication.

A. W. HARLAN.
TRUMAN W. BROPHY.
EDGAR D. SWAIN.

THE DENTAL REGISTER.

VOL. XLVIII.] JUNE, 1894. [No. 6.

# COMMUNICATIONS.

## Diseases of the Maxillary Bones and their Periosteum.

Read in the Section on Dental and Oral Surgery, at the Forty-fourth Annual Meeting of the American Medical Association.

BY VIDA A. LATHAM, F.R.M.S., D.D.S , CHICAGO, ILL.

[*Continued from May Number, page* 230.]

*Tumors, Neoplasms, Non-Malignant* —Fibromata of the jaws resemble fibromata of other parts, but they have two origins: the periosteal, springing generally from the alveolus, and indistinguishable except by its size from epulis, and the endosteal, which springs from the interior of the bone, and in the upper jaw generally makes its way into the antrum and nasal cavities, or in the lower jaw expands the inner and outer plates of compact bone. Fibromata seem to owe their origin, in many cases, to the irritation of decayed teeth, which may sometimes be found embedded in the growth or displaced by it. The growths produce absorption by pressure, and may in this way destroy a great deal of structure.

Epulides are of two kinds, fibrous and sarcomatous. The fibrous epulis starts from the periosteum of the jaw, and is covered by the epithelium of the gum. The growth consists of long fasciculi of white fibrous tissue, which have a radiating arrangement, in many cases from the point of growth; the most noticeable feature is the length and slenderness of the fibrous fasciculi and their loose felted arrangement. Epulides depend for their hardness on the amount of fibrous tissue they contain.

*Angiomata* may also occur, and I know of one case growing from the posterior wall of the antrum, which was diagnosed as osteo-sarcoma by a most competent physician and surgeon. The true nature of the growth is shown here by two micro-photographs, taken from the specimen before it was hardened, and it will easily classify itself into a fibro-angioma, showing two distinct kinds of structure, the fibrous and the angiomatous, thus accounting for the excessive hemorrhage which occurred during the operation. It is well to remember that we may have both simple, cavernous, lymph-angioma and angio-sarcoma.

*Enchondromata* are less frequent in occurrence in the jaws than fibromata, and like them may for convenience be divided into periosteal and endosteal. The disease usually appears early in life, springing from the surface of either jaw or from the antrum or the interior of the lower jaw, and has a more steady and rapid growth than fibromata. In the case of the superior maxilla the growth is more tuberous, and is apt to send off processes into the fissures and cavities of the skull, giving rise to great deformity. Enchondromata as regards their micro-structure vary greatly, and we must prepare for many enigmas in studying them. Whenever chondroma is associated with sarcoma it seems to take an erratic course; when however, a pure chondroma is found, it is always more near the normal type of cartilage. All the chondromata are very liable to calcification, and they sometimes undergo a softening process and small cysts form in them.

*Osteomata* are a further step in the development described under chondromata. They are formed from newly-developed connective tissue, and it is a fact which distinguishes them from so-called ossified inflammatory products. After decalcification, under the microscope they resemble true bone, and, like it, can be divided into hard and cancellous. Many, however, vary a good deal from the normal type, especially the hard variety, which is sometimes extremely dense.

Osteomata have been described as primary growths, but are extremely rare. True bone is sometimes found in cartilaginous and fibrous tumors, and also in sarcoma as the myeloid variety. The cancellous osteoma is the simplest form, and due usually to a misplaced tooth; and the fact that numerous serious operations have been performed in these cases, should make every one extremely careful in their diagnosis. The growth is slow and reaches a large size, but when removed by section of the healthy bone it shows no tendency to recur.

Under the term, cystic sarcoma, many varieties of growths were classed, and by some authors termed a variety of epithelioma, (see Mr. Eve, in Erasmus Wilson Lectures for 1882), but they differ so completely from the ordinary form, as to rapidity and recurrence after removal, that as yet further observations must be made before any decision can be arrived at.

The largest and most dangerous class of growths met with are the *sarcomata*, divided into three classes by the shape of their cells: *a*, round; *b*, spindle; *c*, myeloid. And these have again a number of modifications and varieties. As the general features are so well known, little or no description will be given beyond a few points of interest which may occur in them. The spindle-celled sarcoma is quite frequent, forming many of the specimens so indiscriminately named "osteo-sarcoma." A point worthy of notice in the recurrent growths is the tendency to become softer with each recurrence, and the patient dies, worn out, with rarely secondary deposits in internal organs.

Round-celled sarcoma has unfortunately not been clearly defined in oral surgery until the progress in pathology became so marked, and even now it is often named wrong. It is still called encephaloid sarcoma of Cornil and Ranvier and others, when we to-day usually regard encephaloid not as of the sarcoma, but of the carcinoma group, as it originates from glandular epithelium. Many of the cases called medullary cancer of the jaw, belong to the class of round-celled sarcoma. Myeloid sarcoma, originally described by Paget, is very common, and found in connection with the alveolus, forming the so-called myeloid epulis, and also in the interior of the lower jaw. The growths vary enormously histologically. In the first place they get their name from the large cells they contain, which closely resemble those found in the marrow of bone; and usually are known by "their red color, resembling raw beef, and are named by Butlin, "a mixed celled sarcoma." In connection with the pure form of myeloid sarcoma we have myxomatous tissue and bony formation or ossification closely combined. The ossification is usually a peculiar shape, the material formed resembles decalcified bone, and contains no lime-salts. By using double and triple staining processes the different reactions in the normal formation can be made out very nicely, and the lime deposited by each individual cell; but in the sarcomatous form of ossification it so far has not been shown. The ossifying process must not be confounded with cases where the growing sarcoma has decalcified the bone in its immediate neighborhood; this is sometimes the case, especially in bones like the scapula, and portions of this in the middle of a sarcomatous growth will cut like fibrous tissue without any decalcifying process. Under the microscope this can readily be made out; the lacunæ in them are larger and often empty, and there are no osteoblasts on their free edges. That sarcoma has a decalcifying power is seen in China, where the jaws of horses are often attacked and so softened that you can cut through them with an ordinary knife, just like cutting a piece of cheese. Myeloid sarcoma also forms one kind of epulis, and care must be taken in making a diagnosis.

Besides these forms, we have alveolar sarcoma, which is a rare and unsatisfactorily described growth. By Wedl it is called "a fibrous form of cancer arising from bone," and should be included under cases hitherto given as scirrhus of bone, which is not strictly correct.

Fibro-sarcoma grows beneath the periosteum, and closely resembles fibroma.

Chondro-sarcoma is a mixed growth, and occurs in both jaws, and frequently leads to secondary deposits in the lungs.

Ossifying sarcoma has been classed for greater convenience under the enchondromata and osteomata and myeloid sarcoma.

Finally, we have to consider carcinoma, which for convenience has been classed as follows into two groups, according to the character of the cells from which they are formed:

Superficial epithelioma: squamous epithelioma.

Glandular epithelium: *a*, columnar epithelioma; *b*, scirrhus carcinoma; *c*, encephaloid carcinoma.

Carcinoma affecting the jaws is only epithelioma of the squamous and columnar form. The first variety developing primarily in the mucous membrane of the palate and gums; the columnar form beginning in the antrum or nose. The two forms rapidly invade all the tissues, even to the bones. When squamous epithelioma begins in the palate or gums it is very often not noticed, and its nature is often mistaken at first. Beginning as a small ragged ulcer, it is often attributed to decayed roots or secondary syphilis, etc., and only locally treated. Ulcer of the palate of an epitheliomatous character is more frequently attributed to tertiary syphilis, and even large gaps in the hard palate caused by epithelioma are supposed to be the result of a broken-down gumma. By involving the subjacent bone, necrosis is induced in the course of an epithelioma, and here again error may arise if the presence of bare bone be regarded as pathognomonic of necrosis, without considering the cause.

Much information and profit can be gained by consulting the following works, to which I owe much information, especially the valuable works of Prof. C. Heath:

### BIBLIOGRAPHY.

Heath, C., Injuries and Diseases of the Jaws.
Heath, C., Lectures on Two Certain Diseases of the Jaws.
Heath, C., Dictionary of Surgery.
Butlin, On the Tongue.
Paget, Surgical Pathology.
Pepper, Surgical Pathology.
Ziegler, Pathological Anatomy.
Eve, Erasmus Wilson Lectures, 1882.
Sutton, J. Bland, Principles of Pathology.
Garretson, Oral Surgery.
Tomes, Dental Surgery.
Tomes, Comparative Anatomy.
Sutton, J. B., Trans. Odont. Soc., 1884, etc.
Wedl. Pathology of the Teeth.
Adams, Path. Soc. Trans., Vol. XII.
Hutchinson, Path. Soc. Trans., Vol. VIII., p. 380.
Salter, Dental Pathology and Surgery.
Salter, Guy's Hospital Reports, 1886.
Journal. Brit. Dent. Assoc. (Malassez.)
Dental Cosmos.
American Text-Book of Surgery.
Black, J. V., Dental Periosteum.

### DISCUSSION.

Dr. J. S. Marshall said the paper was an excellent one, and the author deserved the thanks of the profession for preparing it. Discussing the paper, he said that it was often difficult to distinguish with certainty malignant growths in the jaws, but he thought it best in cases where there was any real doubt to cut away tissue, though it may be benign, rather than take the chance of letting a malignant growth increase, and so endanger the life of the patient.

The tumors most frequently seen are called epuloid, and he thought the one described by the essayist to have been of that character. These are not usually malignant, but they sometimes take on a malignant character. He could not account for the great swelling in connection with a tumor of this size. Dr. Latham had asked him about it, and he had told her he had not seen such a case; however, she had been informed by other dentists that it was common. His treatment would be the immediate and thorough removal of such a tumor for fear it would take on a malignant growth.

Dr. Taft asked how long it had been since the tooth was removed?

Dr. Latham answered: "In February; no other tissue was removed, the tooth came away quite easily, and the cavity healed up very nicely."

Dr. Taft said this emphasizes the danger of making more of a case than belongs to it. If the parts returned to a healthy state it would eliminate any idea of malignancy. In diagnosing and treating such cases, much attention should be paid to the physical characteristics of the patient. If his condition is generally good, it is safe to consider that the tumor is of a benign character, while a tumor of the same appearance and character in one whose system was diseased would probably take on a malignant character. He had been called upon to assist a physician to remove what the physicians called an epulis. To his surprise, the physician removed the cuspid and bicuspid teeth, then took a saw and cut out a notch including the sockets of the two teeth. His own treatment would have been to have considered the growth a little, insignificant, benign epulis, and he would have removed it with a pair of scissors. He spoke of several cases in his own practice of the kind, and said it was well not to be too hasty in pronouncing a growth of this character malignant. The growth, origin and causes should be studied, and the case kept under careful observation for some time.

**Dr. Marshall** said the only positive way to diagnose a tumor is by the microscope. When the tumor is large enough and of such a character that a piece can be cut from it with the scissors, he examines it himself, and has it examined by some one in whom he has confidence, and if it is pronounced malignant then he removes it, going deep enough to be sure to remove all the affected tissue. By prompt and thorough removal the life of the patient may be saved, but if operation is deferred until the disease has invaded the glands, the growths will return at the same, or at some other place, and the life of the patient will not be for long. He related the case of a patient, a man about sixty years of age, with an epuloid tumor between the first and second bicuspids on the right lower side. There was considerable ulceration, involving gums and cheek, almost to the corner of the mouth. On examination it was pronounced an epithelioma. He made a most thorough operation, removing three teeth, the alveolus down to the dental canal, and part of the cheek. The parts healed nicely; the wound in the cheek by first intention, and fifteen months having passed since the operation, there has been no recurrence of the growth. He, however, expected that if the man lived a few years it would recur, either where it was before or in some other place.

**Dr. Taft** said that the class of patients operated upon in general hospitals was so far below the class that a dentist or physician would have in his private practice, that it was not safe to accept what was true of one class as applying to the other. Hospital patients were, to a very large extent, little more than wrecks, their whole system broken down by poverty, vice, and disease; no vigor or recuperative power, and a disease which could be safely handled and cured under better circumstances was well nigh hopeless with them.

He spoke of a case in his practice of a girl with a tumor on her jaw as large as a pigeon's egg. Relief was sought because of the rapidity of the growth. Upon examination, Dr. Taft thought it not malignant. Two surgeons were consulted. The first one after a careful examination said he could not decide; the second after looking at it two minutes said it was malignant, and unless the whole side of the jaw was removed the girl would die of it. The decision arrived at, however, was to merely remove the tumor and carefully watch the case. Some time after the tumor returned and electrolysis was used, and it entirely healed and never returned. If the advice of the surgeon number two had been taken and the girl's jaw sawed away, she would have been mutilated for life. He spoke of the great importance of the dentist being able to judge of the character of such growths. They come under the notice of the general practitioner. The best manner of removing them when small, and of a favorable shape, was by a ligature. This is painless and saves what sometimes would be an alarming loss of blood. The patient should be carefully treated before and after the operation so as to get and keep the system in the best possible condition.

DR. E. S. TALBOT spoke of the growth of secondary dentine as shown in the case of which Dr. Latham spoke. These growths were difficult to diagnose, and they produce periostitis and neuralgia. They are most frequent in the pulp chamber and root canal, and neuralgia results. The only treatment is the removal of the tooth.

DR. J. S. MARSHALL spoke of the formation of calcific deposits in the pulp chamber, and said that, as a rule, peripheral calcifications do not give any trouble, but the interstitial form always makes trouble. One reason that they are difficult to diagnose is that the patient can not place the seat of the trouble, though sometimes the tooth feels big.

DR. A. E. BALDWIN said that it was best when in doubt to treat an epuloid growth as if it was malignant, as it was better to go too deep than by taking the other course to endanger the life of the patient. We should, however, take advantage of the knowledge of other physicians when attainable, and above all other things fit ourselves to be able to discriminate by a wider and deeper course of study and research. The whole field of microscopy is opened by such a subject as this, and it is only the intense and rapid student that can take advantage of the facilities for learning that come to our hands. He spoke of a case of his own which he thought was a simple, harmless growth, but took advantage of the offer of a friendly microscopist to examine it, when it was found to be malignant, and so he operated accordingly.

Dr. Latham, in closing the discussion, said that there were some dentists who never looked further than the tooth they were working on, and she thought they should be more careful to examine the whole mouth and note every appearance of disease, thereby serving their patients better. She spoke of a case in her own practice where she had discovered an epithelioma, which would be removed by a surgeon. She thought that it was dangerous, however, for a dentist to undertake the treatment, by means of caustics or other remedies, of growths in the mouth unless they had sufficient knowledge to discriminate between harmless and malignant tumors.

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## The Indications of Dental Exostosis.

BY MARY LINDE, ANN ARBOR, MICHIGAN.

Sometimes hypercementosis exists without giving rise to any trouble. When the dentist is called upon to extract a tooth or a root, for some reason or the other he will, in these cases, be greatly surprised to find hypertrophy of the cementum, and on request he will hear that the new growth has never perceptibly disturbed the equilibrium of ease. In these instances the deposit has been a very gradual one.

It is not these cases which are liable to puzzle us in our future practice, but it is where this affection results in so-called idiopathic neuralgia, and the patient requests of us to make a diagnosis as to the cause of the symptom.

This is a very difficult task in almost all cases; often we can only arrive at a conclusion when every other disease is excluded; sometimes we shall fail entirely, because we can not locate the pain on account of its reflex character.

If the pain is localized, the diagnostic peculiarity is that of a dull, gnawing, uneasy sensation, a pain not absolutely persistent, but decidedly remittent, even intermittent, but not returning periodically. The pain is not agonizing, has never the decided paroxysmal acuteness of pulp irritation; it has length of duration instead of intensity. In rare cases we are able to feel the enlargement by passing the finger over the side of the root. Sometimes there is looseness of the tooth in its socket, the peridental membrane is congested, the tooth feels longer, and is sore to percussion.

But, as a rule, the most careful local examination does not reveal anything. There is no enlargement indicating the abnormal growth, because the alveolar process is absorbed, and it is this space that is taken up by the hypertrophied portion. The gums seem perfectly normal. Lateral pressure and percussion give no response.

If the local indications are not decided, the history of the case may guide us. The gradual increase of the uneasiness and the great length of time during which this additional growth develops is one of the most certain diagnostics of dental exostosis. It never takes less than months, usually a year or two, even more.

When the seat of disease can not be localized, it is impossible positively to determine the existence of hypercementosis. In these instances the affection has proven capable of producing almost any amount of suffering, sometimes of frightful severity. As Flagg says:

"The amount of trouble from dental exostosis is simply immense; pains in distant parts of the body, paralysis of the face, arms or hands, even epileptic fits, deafness and blindness."

In order to be able to make a diagnosis, we must know the conditions which are liable to bring about this change. While Tomes attributes exostosis in a great majority of cases to caries, other writers differ with him, and, as it seems, for good reasons. Flagg, Abbot and Guilford find the main cause in malocclusion, protrusion of fillings under the gum margin, and in some cases slow deposition of tartar. Any irritation which would stimulate the functional action of the peridental membrane and not exceed its nutrient capabilities, must result in excessive formation of cementum.

Marshall believes that beside other causes, hypertrophy of cement tissue is an occasional occurrence in individuals of a gouty or rheumatic diathesis, due to an undue amount of uric acid in the system; most commonly found in chronic cases of long standing, and often associated with enlargement of the joints, long bones, or nodular formation in other localities, conditions which are somewhat analogous.

If, therefore, we do not find any local cause which could account for the occurrence of excementosis, we do well to inquire for the diathesis to these diseases, and whether previous extractions have demonstrated the presence of exostosis.

When we get an affirmative answer as to the existence of the rheumatic diathesis, we can not say yet that our diagnosis is correct; we are not yet justified in opening the drawer for the forceps as the only means of relief to our patient.

Interstitial calcification of the pulp, formation of so-called pulp stones, frequently occurs in persons of gouty and rheumatic tendency. It is this affection with which hypercementosis is most easily confounded; both give rise to severe neuralgia, and in both cases no external symptom indicates the true character of the trouble. There will be no other choice for it than to open the pulp chamber and to extract the pulp. If pulp stones are present we shall in most instances be able to save the tooth; the attempt to do so will be our duty.

Imbedded wisdom teeth sometimes give rise to the same range of trouble as dental exostosis.

An interesting case where I erroneously diagnosed hypercementosis came under my observation last fall. The tooth had been devitalized, and the roots filled a year ago, and since that time caused soreness and irritation, looseness, and all the unpleasant results of exostosis in a slight form. In taking out the root-filling it was found that the dentist who had filled the tooth drilled through the side of the flat bicuspid root, thus injuring the surrounding membrane. The soft root-filling was pressed out, and impinging upon the pericementum caused the constant irritation. After filling with a stiff material, the tooth returned to its normal state, and has not given rise to the slightest uneasiness since, thus showing conclusively that there was no exostosis.

After we have excluded all these different causes of the same symptoms, we have the right to conclude that the affection is caused by hypertrophy of the root or the alveolus, the latter being exceedingly rare, we presume hypercementosis.

Having thus conscientiously made our differential diagnosis, we are justified in employing the forceps; the difficulty with which the extraction is performed will, in most cases, tell us that our conclusion was correct before we can convince our eyes. But as has been said in the beginning, it is often utterly impossible to diagnose with absolute certainty. The extracted tooth may, after all, not have been the cause. In such cases the dentist ought not to feel discouraged, having uselessly sacrificed a tooth. It is always better to sacrifice a tooth than to impair the health of the individual by administration of powerful narcotics. The dentist knows that he has not acted thoughtlessly. He arrived at his conclusion after conscientious searching for the cause, and if his conclusions proved to be a failure, we all make mistakes.

## **Diarrhœa of Dentition. (Treatment.)**

[MEIGS—*Med. Rec.*]

—MIXTURE.—

| | |
|---|---|
| Dilute sulphuric acid | 12 drops, |
| Morphine sulphate | ¼ grain (16 mg.), |
| Cognac<br>Syrup ginger | of each, ½ fl. oz. (15 c.c.), |
| Distilled water | enough to make 3 " (89 " ), |

One fluid dram. (3.75 c.c.) every three hours.

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CHLOROFORM is recommended as being one of the best remedies for the controlling of external hemorrhage, whether arterial, venous or capillary. It may be applied with lint or cotton.

# Articulation of Artificial Teeth.

(*Continued from Page* 142.)

BY GRANT MOLYNEAUX, D.D.S., CINCINNATI, O

NOTE.—Figs. 1 to 5, Page 133, were inverted by printer and should be observed with book upside down.

Some criticism might be made for not reproducing the engraving taken from Dr. Black's Anatomy perfectly, but we only desired to show the relation of the teeth, especially the cutting edges, consequently the other part of drawing was sacrificed. The drawings were only used by us to save time, as we have a skull with an arrangement of teeth, and if photographed would hardly be distinguishable from Dr. Black's drawings.

The "Anatomical Articulator" is composed of brass wire and tubing and illustrated in Fig. 10. It consists of a base and two brass bows, the bows being detachable by loosening the set screws. The articulator as seen in cut is in position of use, *the*

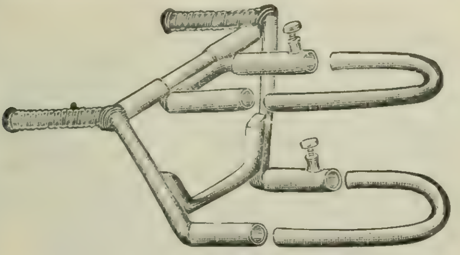

Fig. 10.

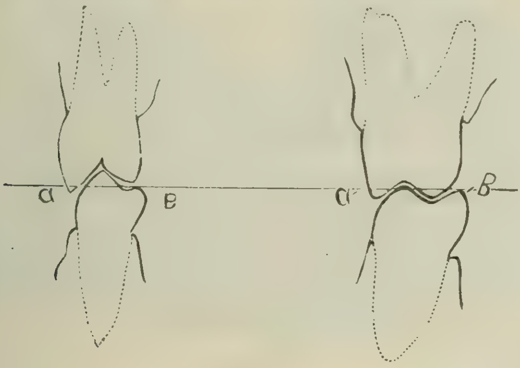

Fig. 13.

*narrow bow being uppermost at all times and upon which the upper model, whether that being an articulating model or a model upon which a set of teeth is to be arranged, is to be mounted; contra, the lower model which is always to be mounted on the wide bow.*

The cross bar or tube to which the narrow bow of the articulator is attached, corresponds to the base of our triangle or the line from *a* to *a* Fig. 9 and *c* to *c* Fig. 16.

At either extremity of the cross-bar is an eyelet through which the "condyle" of the articulator works.

The two spiral springs back of the condyle take the place of the muscles and serve to keep the models in the position of occlusion, except when moved about to get the different bearings of the artificial teeth. With a normal natural denture the opposing

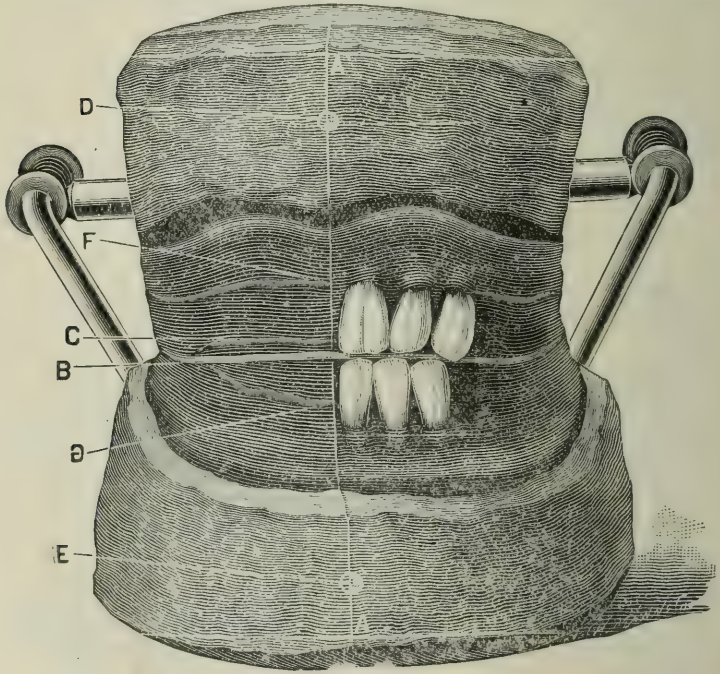

Fig. 18.

teeth are in positive contact during occlusion and the same condition should be carried out with an artificial denture. Before attempting this plan of articulating teeth, the conditions must be made favorable to successful results.

1st. We must obtain a correct occlusion of the lower jaw.

2d. The wax articulating models or "trial plates" should represent the exact length of lips. (Fig. 18.)

3d. The patient must be observed full face and profile, and facial contour perfectly established.

4th. The median line of face marked distinctly on the trial plates.

We will now try to give accurately the steps as they are followed in using this machine for the articulation of artificial teeth. The two set screws are loosened and the brass bows pushed firmly back into the sockets and then tightened. The occluding wax trial plates should represent the exact exposure of teeth (Fig. 18, F to B, G to B, and also the plane of the cutting edges of the incisors, Fig. 18 B.) *The horizontal surface of the base of the plaster models should be trimmed to represent the same plane as the occluding surface of the wax articulating models*, Fig. 18 A and A. The purpose of this is to mount the case as squarely as possible in the articulator.

The lower model is adjusted upon the wide bow, the heels pointing towards the condyles, the "bite" wax and upper model also in position, when the narrow bow is turned to rest on the base of upper model. We now take a pair of dividers, separated to measure four inches, placing one foot in a small depression at the condyle and measuring the distance to median line of wax bite from each condyle.

Rule: Let the median line of the mouth, F to T Fig. 9, fall midway between the condyles of the articulator and at the same time let the median line of the bite at the occluding edge of wax be equi-distant (four inches) from each condyle; when in this position pour plaster, quite thin, over the narrow bow and upper model and at once lift the articulator up by the base and make a bed of plaster on table into which the wide bow and lower model is placed. When the plaster hardens, the excess should be trimmed away and we are ready for the teeth.*

We must now repeat a previous statement. The wax articulating models or "bite" should represent the exact length of lips, the proper contour of lips and the median line of face. If these points have been faithfully observed then the lower wax articulating model at the median line would represent exactly the position of the central incisor teeth, inferior. All that is necessary is to cut down to the base plate through the median line of the wax and take out a section, upper and lower, *on one side only*, and enough to admit of placing the central, lateral and cuspid teeth on one side (Fig. 18.) After these teeth are appproximately placed, the measurements given in last paper are to be followed to fix their exact position, when they should be waxed fast. We have stated that the wax models represent the length of lips, which is true, but we have not accounted for the overlap. When the overlap is determined, just that much should be removed from the occluding surface of the upper wax model. (Fig. 18, B to C.) After arranging the central, lateral and cuspid, enough wax is removed to admit of the bicuspids and lastly the molars. By this plan the trial plates will at all times be held firmly in contact with the plaster models. When we have one side complete, we begin on the opposite side and finish as the first.

It has been suggested by those not familiar with the articulator that a screw is necessary for opening and closing the bite. Such a screw is not only unnecessary but would be a detriment to the instrument. The wax establishes the bite at all times, and if any lengthening is necessary more wax can be added, if shortening is necessary some wax can be removed.

A word regarding the position of molar teeth may not be out of place. A custom prevalent with certain operators is placing the molar teeth too near the cheek. If a plumb line were dropped from the lingual border of the lingual cusp of the second inferior molar, it would fall clear of the body of the jaw and not through the center of the edentulous ridge, as many artificial teeth are arranged. When the teeth are placed too near the cheek, it is constantly irritated and the teeth are, during lateral movement, thrown out of line of use. The position of the molar teeth would be more nearly correct if a perpendicular line falling through the buccal cusps would also fall through the center of the edentulous ridge. This arrangement might, upon first observation, appear to impede the movement of the tongue. Such is not the case, but to the contrary, the molar teeth are in the best position to receive the greatest assistance from the tongue and cheek in keeping the food in position for mastication.

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* For mounting a full upper or lower case where we have the natural teeth in one or the other jaws—obtain a model of the teeth and place this model in indentations on the wax trial plate and mount, making the same measurements as with the entire denture.

In the selection of teeth, one should keep the requirements before him constantly, and select those teeth that will require the least alteration. There are very few sets of teeth, however, that can not be improved, for articulation, by judicious grinding. By refering to Fig. 12 or 3 and 13, the relative size of the cusps of bicuspids and molars will be observed. The buccal cusps of the superior teeth being longer than the lingual, and *vice versa* for the inferior.

These diagrams will indicate the necessity and method of grinding. For fear these drawings may be thought ideal, we take the liberty of reproducing another cut from Dr. Black's Anatomy, Fig. 13. This drawing being taken from life, is a most excellent subject for study, it indicating not only the plan by which artificial teeth should be articulated, but is right in line with our remarks on the angles of teeth. Compare with Fig. 3. Refer now to Fig. 16 and we observe that the first superior bicuspid tooth is the larger. In the lower denture the first is the smaller. In most artificial sets of teeth we find the first bicuspid above the smaller, and altogether too small to look well next to the cuspid. By reversing the order, placing the second artificial bicuspid for the first, or the larger of the bicuspids first, the appearance is not only improved but a better articulation is obtained.

There is one other mistake in many artificial sets of teeth, viz., the first inferior bicuspid lingual cusp is quite as large as the lingual cusp of the second bicuspid. Nature only intended one cusp (buccal) for these teeth, as a lingual cusp is not only useless, but it is in the way of the tongue. Remove it entirely with the stone. The manufacturers of artificial teeth can not construct moulds to suit every individual whim, but we believe, however, that they are trying to produce teeth as nearly life-like as possible, in both color and shape, and with a fair variety of moulds from either the standard makers, forms can be found that will suit the most fastidious. What little there is wanting we can usually add with our mineral paints and the grindstone.

With the above remarks and with the aid of Figs. 17, 16 and 13, we believe that the clew to a natural arrangement of the artificial teeth is clear, only needing a little practice to execute it rapidly. When one is familiar with this method the work can be performed in quite the same time as by the old methods, and with an infinitely greater degree of accuracy. The articulator has many other virtues, but I will refer to only two more. To those doing any amount of regulating, the instrument becomes invaluable, from the fact that the models can be mounted and studied as accurately as in the mouth.

To those doing any quantity of gold plate of continuous gum work, an enormous amount of labor can be avoided by taking the measurements of the completed dentures with a pair of dividers and marking them on the base of the models, together with the color and size of a central incisor. The set screws can then be loosened and the models with the bows intact laid away and properly labeled for future reference. They can be referred to at any time, and should the patient be a thousand miles distant duplicate dentures can be constructed and forwarded with every assurance of a successful result. One " base" is all that is really necessary; the bows can be made *ad libitum*, and when one case is mounted and the plaster hard, the models can be slipped out and a new set of bows adjusted for the next case.

We regret our inability to do the subject justice on paper, but if we have awakened in any person a desire to familiarize himself with and apply the method to suffering humanity, our labors will have been fully rewarded.

By referring to Fig. 18, the reader will observe the plan of arranging the wax articulating models and how the markings are made on the wax. A—A represents the base of the plaster models trimmed to conform to the same plane as B or the cutting edge of wax model from cuspid to cuspid, which line indicates the plane of the incisor teeth. The distance from C to B is the length of over-bite, and as the wax models show the length of lips, it is evident that the wax model must be made shorter by B to C. The wax on the occluding surface of the upper wax model must be trimmed off to the line C. Before trimming off the wax it will be necessary to use the dividers in order to retain the exact length of teeth. Place one foot of dividers in a depression on model at D and the other at B and fasten.

The lower can be marked from E to B at same time, say this distance is an inch and a half from the depression at D to B and from E to B. Mark this on base of models. Should, for any reason, the wax models become destroyed, or your dividers be changed, they can be easily re-adjusted by referring to marks on base of models.

The line B is made to approximate in the wax the curves described by the cutting edges of the teeth. C is the point to which the lower lip is dropped and F the point to which the upper lip is raised in laughing. The lower teeth are in position, the upper only approximately. After our measurements are made on the occluding surfaces of wax we trim off the upper wax from B to C and let the teeth overlap.

In concluding this paper we must make mention of the fact that if the bite is taken wrong, this articulator nor any other will make it right. Time spent in taking a correct occlusion of jaws and other markings will never be spent in vain, as it saves an endless amount of trouble.

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MRS. JANE L. FOWLE, of Dedham, Mass., has been awarded $450 by a Boston jury against a dentist who extracted a sound tooth instead of a decayed one.

# SELECTIONS.

## Longevity.

BY D. E. NELSON, M. D., CHATTANOOGA, TENN.

Read before the Tennessee State Medical Society, April 10, 1894.

The subject of the paper I bring before you is longevity; a subject that has been a fruitful and profoundly interesting theme of discussion, not only in our profession, but among thinkers and students in every department of knowledge and in every age. Even the comparatively unlettered masses of mankind have not permitted it to pass their observation without their quota of crude, confusing, and altogether irreconcilable opinions and conjectures. There seems to be a peculiar fascination attaching to it, that instinctively challenges attention and stimulates mental activity until our faculties are not satisfied without, at least, a voyage of discovery. Like everything in existence, the deeper it is immersed in mystery, the greater our curiosity to solve it, or, at least, to make the effort, and to satisfy ourselves whether or not it may be a new departure in the course of human events, or a piece of charlatanry utterly unworthy the valuable time and precious thought spent upon it. If it is governed by any specific law, that law is at yet undiscovered. If it is subject to any particular regimen, that also remains hidden.

Is it not surprising that, notwithstanding all that has been written on the subject of longevity, so little is really known of the causes and conditions of long life? Statistics show that a majority of those living to be more than one hundred years old are women. Sir G. C. Lewis, who carefully investigated this subject, positively denied that any *man* ever reached a hundred years, though he was nearly convinced that there were in his day some authentic cases of *female* centenarianism. His argument for his position, was that since the Christian era, no person of royal or noble birth was ever alleged to have reached that magic limit. The lives of the centenarians swell or diminish in length as we advance or recede from prehistoric times. If it be argued that men in high official positions are exposed to greater dangers and more exhausting labors than other men; that the cares of state, the fierce contentions of politics, the brain-work incident to tangled affairs cut short their days, it may be urged on the other hand, that the higher the station the better the medical attendance, the food, air, clothing, and all other conditions on which health and longevity are supposed to depend. It must be admitted that the higher a man's rank the greater is the chance of accuracy in respect to dates; and that if in all the cases which can be easily attested, centenarianism has been found to be a myth, then there is a strong presumption against the obscure centenarians who grow up in places where the system of registration is unknown, and where skepticism is less common than credulity and love for the marvelous. The presumption, however, is liable to be rebutted by facts; and we think they exist in sufficient abundance, not only to overthrow it, but to prove centenarianism beyond a doubt. Flourens was of the opinion that thirty years is the age of man's maturity, and that it marks one-third of his life.

We are justified in saying man has a normal life of ninety to one hundred years, and that by reason of strength he may reach one hundred and ten years. The Biblical expression: "His days shall be one hundred and twenty years," has been thought to mean that this should be the extreme duration of life; others think it meant the average. Judging of the subsequent facts the latter appears to be the correct interpretation. Abraham lived one hundred and sixty-five years. Joshua one hundred and ten. An inscription on an Egyptian monument states the extreme duration of life in that country to be one hundred and ten years. This was the age of Joseph. In the time of David a man of eighty was considered very old. The great prophet king himself reached only seventy-five years. In the ninetieth Psalm, tenth verse, it is said: "The days of our years are three-score years and ten, and if by reason of strength they be four-score years, yet is their strength labor and sorrow, for it is soon cut off and we fly away."

Seventy in the Middle Ages, was considered a great age, which few attained, but it is a fact that in modern times the average is greatly increased. But if normal longevity is thus established, what does science teach as to possible longevity? To what period may exceptional lives extend? May not individuals be endowed with matter of life so largely, and have so slight expenditure, that life may be extended far beyond the limits now fixed by various writers? Is one hundred years the extreme limit of human life, and may we not, under favoring conditions, extend life to variable periods much beyond one hundred years? In the patriarchal age man led a natural life. He lived principally out of doors and took moderate exercise. The tax upon his nervous system was moderate, his food was simple and nourishing, and his digestion consequently good. Accident and old age were then the principal causes of death. At the age of seventy-five, Abraham migrated with all of his possessions. Isaac was born when his father was one hundred and his mother ninety years of age. Abraham was over one hundred and twenty years when he bore the great trial of his faith. Jacob lived one hundred and forty-seven years, notwithstanding his troubles.

To go back to the Romans, Pliny states, from the record of a census taken during the reign of Vespasian, that there were living in the year 76 in Italy, in a certain district, one hundred and twenty-four persons who had attained the age of one hundred years and upward. Haller, long ago declared that over eleven hundred persons had been known to have lived to various ages, between one hundred and one hundred and sixty-nine years.

Thomas Bailey's book, "Records of Longevity," published in 1857, contains the names of about four thousand centenarians, and Dr. Van Owen has collected notices of six thousand, two hundred and two. Of the latter we have the names, country, conditions and date of ninety-nine, who reached the age of one hundred and thirty; of thirty-seven, who lived to be one hundred and forty; of eleven, who reached one hundred and fifty; of seventeen, who exceeded a century and a half. Lord Bacon says that the Countess of Desmond lived one hundred and forty years and cut three sets of teeth. Allen's "American Biographical

Dictionary" gives the names of more than two thousand centenarians; among them are Abraham Bogart, who died in Tennessee in 1833, at the age of one hundred and eighteen, and Francis Age, who died in Pennsylvania in 1767, aged one hundred and thirty-four. Judge Basil Hamilton, of Kalamazoo, Mich., who died a few years ago, aged one hundred and three, was one of a family of twenty-three children, and he himself had seventeen of his own. Dr. Archer Atkinson, in the *Virginia Medical Monthly* for February, 1894, in an article on longevity, says that Lucy Kennon, of Kentucky, was still living in 1876, and aged one hundred and twenty-three years; that Rosetta Washington, of Louisville, Ky., aged one hundred and twenty-one years, was still living in 1888. Stephen Goodale, of York, Maine, died ten years ago, aged one hundred and eighteen. Antoine Save, a native of Normandy, lived to be one hundred and thirty years. Joseph Crele, of Wisconsin, died aged one hundred and forty years. Samuel Stocker, born near Clarksville, Tenn., February 1783, is now living in good health at Toledo, Ohio. George Foster, colored, died in Chattanooga, April 17, 1892, aged one hundred and twelve years. Catherine Patton, colored, is now living in New York city, aged one hundred and eight, and has two daughters living, aged respectively seventy-four and seventy years.

Without considering further the arguments brought forward to establish normal and possible longevity, we may state it as a truth, accepted by scientific men, that man can, to a great extent, control both. The above cases taken together, however incredible some of them may be, seem conclusive. Granting that many of them are open to suspicion, yet after the utmost allowance has been made for errors, misstatements, and wilful exaggerations, enough still remains to establish the truth of ultra-longevity beyond all rational doubt. It is so generally admitted that the duration of life has increased during the present century as to call for no proof. But what are the conditions of long life, so far as can be gathered from the known cases? Happy and calm will be the sleep of those who, on their pillow, can muse on the consolations of the Gospel, and resign themselves implicitly and without wavering into the keeping of a Heavenly Protector and Father. Arbuthnot said: "The instances of longevity are chiefly among the abstemious;" "More men dig their graves with their teeth than with the spade."

Are agricultural districts more favorable than manufacturing; the fresh, open country than the crowded city; mild climates than those whose skies are perpetually scowling? Statistics, well authenticated reports on sickness and mortality, say rural districts have, at most, the advantage of one in two hundred deaths above city districts, and one in five hundred above the town. Against the overcrowding, the bad air, excitement, and the liability to accident in the cities, are set the better water, the greater variety of food, the better knowledge of the laws of health, the more accessible and skillful medical aid, so that the advantages and disadvantages are nearly balanced. The dweller by the sea naturally selects the mountain for his diversion in the summer, and the mountaineer in turn goes to the seacoast, and comes home again in the autumn as to a haven of rest; or if he must labor it is with something like glee that he rejoins his work. After all, we are constrained to say: "There is no place like home." Hot climates have no superiority over cold; China is no more unhealthy than Norway, Iceland or Greenland. Is exercise a vital condition of longevity? Some have said not, in view of the fact that a vicar, cited by the London *Quarterly Review*, Rev. Wm. Davies, reached one hundred and five, though his only exercise for the last thirty-five years was to slip one foot before the other from room to room. Men have lived one hundred years and upward, who only taxed their physical powers to walk one hundred yards a day from house to office and back. Some of the strongest constitutions have been possessed by old soakers. Daniel Bull McCarthy, of Ireland, who drank freely of undiluted rum and brandy during the last seventy years of his life, died in 1752, aged one hundred and eleven. George Kirton, of Yorkshire, a hard drinker, lived to be one hundred and twenty years old. But these are only exceptional cases.

Is a proper diet a *sine qua non* of longevity? All writers on health denounce newly made bread, and especially hot bread, and not a few denounce tea and coffee; but can not each of us call to mind the names of very old people who have been for the greater portions of their lives free users of the same? Shall we declare in favor of frequent bathing or personal cleanliness? Animals get rid of the outer layer of skin in some way. In some species, certain reptiles for example, the outer skin is shed entire at certain seasons. Birds cast their feathers, and fish their scales; and at each casting off of his kind, the vital processes are afterwards carried on with more energy, because the drains and sluice-ways of the surface are not blocked up at their mouths by broken down epidermis; so in man, the skin is removed; only the process in a state of health is gradual and less startling in its visible signs. What shall we say of "Lady" Lewson, a London widow, who never washed her rooms, nor bathed, and declared that people who bathed were constantly taking cold; but she habitually smeared her face and neck with hog's lard. It is said of the Icelanders, that though they are very uncleanly and suffer much from skin diseases, especially leprosy, their longevity is greater than that of the nations of Europe.

The one great question of sanitary science is to secure to each individual, death from old age. On every hand we witness the prodigal waste of human life. Of the children born, what a vast percentage never see the anniversary of their birth! What a large percentage die under five years of age! And how few, comparatively, reach the age of ten! At twenty the generation has dwindled to an insignificant minority, and at thirty-three to forty-five disappears altogether. The science of life reveals to us the stupendous fact that man is born to health and longevity, and that disease is abnormal, and death, except from old age, is accidental, and that both are largely controllable by human agencies. We find that physiology teaches that in every tissue and in the corporate whole, there is inherent death.

It is evident, therefore, that the question of longevity is to be determined by estimating, correctly, vital endowment and vital expenditure. In man, the tendency to individuation is strongest and the degree of evolution is the highest. Man being omnivorous, can secure his food from many sources. He can sustain vigorous health on the products of the soil, or the river, or the forest. Nor need he expend his strength unavailingly in search of food, for by his ingenuity he can devise means of securing it with but slight effort. By suitable protection, man may and does husband his native resources and reduce to a minimum the expenditure of his vital forces. Consider also, by what skillful appliances he continues to repair the wastes and inroads of decay or accident upon his bodily organs and functions. It is a fact that the average length of human life has gradually increased in many civilized communities.

In 1665, in London, one twenty-third of the people of that city died, but now the rate of mortality has been reduced to one forty-fifth annually. Is this not proof of man's advance in civilization, which enables him to live with less expenditure of vital force, which leads him to see his own highest welfare in the common effort to promote the advance of sanitary science?

Mr. Mathews says that health is not a condition of long life, and that long life is no more dependent upon health than upon great muscularity. He cites as proof that the Tom Hyers and Heenans, great prize fighters, and heavy weight lifters, who could fell an ox with their fists, were always ailing, and rarely lived to be more than fifty or sixty years old; and that Dr. Winship, of Boston, who could lift three thousand pounds, died aged forty-two. The celebrated Galen had a weak and delicate constitution, yet by strict temperance and evenness of temper, lived one hundred and forty years. It is said that his rule in eating was to rise from the table before his appetite was satisfied. Dr. Southy, in the London *Lancet*, ten years ago, said that the three oldest people he ever knew were women, who reached respectively, eighty-nine, ninety-eight, and one hundred years, and were nearly all their lives of infirm health. And thus I might go on and cite numerous other such cases, but this is enough to bring within the scope of this paper.

In spite of all these facts, it is hard to believe that virtuous habits, abstemiousness, exercise and cleanliness do not conduce to longevity. But the one thing that outweighs all other favorable circumstances is what is called "a certain bodily and mental predisposition to longevity." Sir Thomas Brown wrote: "There are persons who are prefigured unto a long duration." Some persons are born with a genius for long life, but it is a gift which can be cultivated, and like any other, it may be destroyed. Those who have this inherited gift will commonly reach old age, though they trample on the laws of health; while those who have it not will die comparatively young in spite of the strictest precaution against disease. How is it that in a race of beings having such a power over its destiny, and striving by every means to obtain long life, but three in every thousand dying reach their pre-ordained longevity? Within one's own observation he sees a vast array of causes abridging life. In his own make-up he sees sickness on a perpetual warfare with his vital forces.

According to the last United States census, nervous and digestive troubles cause nearly one-third of the deaths. Every point of man's system is subject to attack from disease. The earth and air teem with the germs of disease; we eat them and we breathe them. It is believed by both civilized and savage nations that disease is the expression of the Almighty's disapprobation of man's immoral conduct; and granting this to be true, may we not add that it is the penalty inflicted for the disregard of that Biblical precept: "Cleanliness is akin to godliness?" The most destructive diseases are of man's own creation. The principal condition which shortens life is, first, and above all others, the expenditure of vital force; and it is scarcely necessary for me to mention the various ways by which the vital force may be expended. At maturity the passions ripen into full activity, and have their full play, and if not held under control they rapidly exhaust the vital strength. Man may yield to all his passions and appetites, and perish at maturity, or be decrepit at thirty. He may so order his life as to fully and healthfully develop his passions and appetites so that they shall culminate in a prolonged and vigorous old age, and thus leave death as a subject of accident. It is an axiom of enlightened statesmanship, that the great want of any country is, and ever will be, a healthy, robust, and long-lived yeomanry. Public health means public wealth, honesty and morality. Our government can in no way better promote the interests of the people than by diffusing knowledge on these points.

One of the most sensible sayings on the art of longevity that has fallen under my notice, so far as longevity can be considered attainable, was that given by an Italian in his one hundred and sixteenth year. Being asked the secret of his living so long, he replied;

> "When hungry, of the best I eat,
> And dry I keep my feet;
> I screen my head from sun and rain,
> And let few cares perplex my brain."

In these lines. especially the last, we have the quintessence of all the advice that has been or can be given on the subject. The deadliest foe to longevity is excitement. "To live long," said Cicero, "is to live slowly."

The careful stock raiser shows his faith in heredity by strict examination of the pedigree; and why so well demonstrated, a great physiologic truth escapes notice when a human being is concerned instead of a horse, is in the nature of a conundrum to all thoughtful minds. He who lives extensively, who avoids all stimulants, takes light and agreeable exercise, indulges no exhausting passions, feeds his mind and heart with no exciting material, has no debilitating pleasures, "keeps his accounts with God and man daily squared up," is sure, if he has a good organism, to spin out his life, barring accidents, to the longest possible limit.

The poet, William Cullen Bryant, when asked the secret of his health and vigor at upwards of eighty, answered; "It is all summed up in one word, *moderation*." The ancients laid much stress on gastronomy, as many idioms in all languages attest. "Heaven sends the food, but the devil sends the cook," is an old saw that is more forcible than elegant. How many a young man squanders on a holiday or an evening's entertainment an amount of nervous energy which he will bitterly feel the want of when he is fifty. It is true that overwork of the eye at fourteen may necessitate spectacles at forty, instead of at sixty. Even warm affections are prejudicial; they subject the owner to constant anxiety, and are as unnerving as the excitement produced by politics or gambling. Nothing is more exhausting than anxiety for a sick wife or child, or nursing a friend through a long sickness, unless you can truthfully say that you take no interest in the result. When a "fine old man" was mentioned in Swift's presence, he exclaimed angrily: "There's no such thing; if his head or heart had been all right they would have worn him out long ago." Wadsworth at eighty, complained:

> "Oh, but the good die first
> And we whose hearts are dry as dust,
> Burn to the socket."

Our fine enthusiasms, if they rise into intensity, are costly, and lessen the number of moments we have to live. Some years ago a gentleman in England set about ascertaining the causes of the premature deaths of his acquaintances who had been cut off within twelve years. Of forty individuals, he found that twenty had died from excessive mental labor or excitement, and twelve of these were not intellectual laborers, but men of the world. Sydenham tells us that one of the severest fits of gout he ever suffered from, arose from great mental labor, undergone in composing his treatise on that disease.

Providence has appointed the succession of labor and rest by the alternation of day and night, yet how many violate this beneficent law by turning night into day and day into night. They sleep while the sun is shedding his life-giving beams, and work amid the deadly influences of the night. Many do not toil at their callings in the night-time, yet imagine that they do a full day's work, and afterwards, with impunity, spend half of the night in charitable labor, or in the pursuit of pleasure or knowledge. But nature can not be so cheated. Occasionally she lets an offender escape for forty or fifty years, but she is evermore "shadowing" him, and hauling him up at last inflicts her penalty just when and where he least expects it. It should be remembered that one can walk farther than he can run.

While all excess is injurious, it must not be inferred that hard brain-work apart from other causes tends to shorten life. Mental labor, apart from grief and fears, from forced or voluntary stinting of the body's needed supply of exercise, food or sleep, and the mind's supply of social intercourse, rather prolongs life than cuts it short. Even overwork of the brain is probably far less injurious than underwork. Nine-tenths of the students and professional men who are supposed to break down from intense toil, wear themselves out, not by repletion of study, but by a vicious misapplication of their moral, physical or intellectual forces.

Lord Brougham lived eighty-nine years. Lord Lyndhurst wore out at ninety-one. Epimenides, the seventh of the wise men, is said to have lived to one hundred and eighty-four. Hippocrates reached ninety-nine, Pythagoras reached eighty, and was murdered. Dr. Franklin was eighty-four. Montgomery, the poet, lived to be eighty-two. Sydney Smith lived to seventy-six, and Sir Isaac Newton to eighty-five. The Right Hon. William E. Gladstone, who retired from the Premiership of England only a short time ago, was last December, eighty-four years old. Dr. Beard, of New York, in an able paper on the "Longevity of Brainworkers," has proven beyond even the shadow of a doubt that the world's hardest workers, so far from being short-lived, show a very high average of life; a far higher average than the world's drones, and those who had added nothing to its accumulated capital of happiness, knowledge, goodness and truth. It is an established fact that not a few of the long-livers might materially lengthen their days by taking more exercise and sleep, and by economizing more carefully the expenditure of intellectual and moral energy.

It is known by every scholar that mental application is one of the most effective means of relieving bodily pain, and that it is especially fitted to soothe the ruffled spirit, and to mitigate the asperity of corroding anxiety and care. Bacon, in his "History of Life and Death," is emphatic in declaring the religious and literary to be among the forms of life most conducive to longevity. "There are," says he, "in religious life, leisure, admiration and contemplation of heavenly things, joys not sensual, noble hopes, wholesome fears, sweet sorrows, continual renovations by observances, penances and expiations, all of which are very powerful to the prolongation of life." There is a popular notion, which has long been deeply rooted, that precocity of intellect is unfavorable to longevity. It has been shown conclusively, that as a rule, a brain of exceptional force is united to a constitution of exceptionally good fiber, and that precocity, so far from being premonitory of early decay and death, is almost a mark of vast undeveloped abilities, and of a prolonged existence crowded with triumphant usefulness.

Three of the most precocious geniuses of their day were Bishop Thirlwall, Lord Macaulay and DeQuincy, yet they lived to the ages respectively of seventy-eight, fifty-nine and seventy-four. Of all the qualities of mind that conduce to longevity, none are more vitally essential than contentment, cheerfulness and hope. Worry kills more men than the most exacting work, whether physical or mental. Legitimate work develops force, while worry checks its development and wastes what already exists. The physician should be engaged to protect the household and individuals from the assaults of disease, to detect and meet the first and very slightest indications of disorder; and thus we shall certainly see life prolonged.

There is no doubt that long life, if it be virtuously and happily spent, is a blessing most earnestly to be coveted. The mere lapse of years, however, is not life; "knowledge, truth, love, beauty, goodness and faith give vitality to the mechanism of existence." The value of time is purely relative; and, if we count it by heart-beats, not by tickings of the clock, or the shadow of the dial; if, "he lives longest," as Bailey says, "who knows the most, thinks the wisest, acts the best;" then many who were rich in years have really died young, while others whose lives measured by the calendar, were cut short early, have been rich in life.

Shakespeare, who died at fifty-two, lived ten times as long as poor old Parr, who could boast of his one hundred and fifty-two years. Mere old age, following an oyster-like existence, during which one has droned away his life in his shell, never buffeting the waves for himself or others is a questionable blessing; but the serene old age which is secured by temperance, sobriety, and the conquest of vicious appetites and passions, the long, mellow autumn of life, in which are harvested the fruits of years of useful toil, is to be coveted and striven for by all.

> "Men deal with life, as children with their play,
> Who first misuse, then cast their toys away."

*Jour. of the Am. Med. Assn.*

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The International Congress of Medicine, held at Rome, received a petition signed by more than seven hundred doctors in India. This petition demands that Latin shall henceforth be the universal scientific tongue, and that a central medical bureau be established, charged with the translation into Latin of all modern works worthy of preservation; also the creation of a medical journal published in Latin, this publication to be called *Salernum*, in memory of the first school of medicine in Europe, founded at Salerno. A society known as the "Ancient Order of Æsculapians" should also be organized; one of the conditions of admission being an original thesis written in either Latin or Greek. The names of Hippocrates and Galen will survive even after future centuries, when the Kochs and Pasteurs *et id genus omne* are forgotten or buried in the chaos of medical oblivion. Modern surgery will survive, but modern medicine, the essence of quackery and pretension, tinctured by the commercial spirit of a rotten age, will perish. So, after all, there will be little that is modern worthy of being presented in the classical tongue, and the task of translation would be a light one. The advent of the new journal, *Salernum*, will be welcomed by those who are worthy of fellowship with the "Ancient Order of Æsculapians."

*The Cincinnati Lancet-Clinic.*

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A Hospital of Lepers, with a laboratory for the study of leprosy, has been established at Rio de Janeiro. Dr. Wolf Havelburg, a German physician, who for the last twelve years has practiced in Brazil, has been appointed director.—*Medical Review.*

# Synthetical Chemistry and Its Relation to the Materia Medica of the Future.

BY FRANK S. HOUGH, M.D.

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There are two terms expressive of two processes exactly opposite in their nature, but which have operated together as copartners in the development and gradual evolution of the sciences, especially in relation to the sciences of chemistry and materia medica. These two technical terms are analysis and synthesis.

For years, and until recently, materia medica was studied and applied more from a purely clinical than a chemical standpoint. Through the manner in which the drugs seemed to impress themselves upon the human organization, and through the selective action they seemed to possess towards certain physiological functions and processes, in experimentation on vast numbers of cases there was built up the great and massive structure of materia medica. Physicians learned to prescribe certain drugs for certain pathological conditions and derangements of functional activity, because experience and the written and verbal evidence and close observation taught them that these drugs brought about cure or amelioration of the symptoms. This was the manner in which the great compilation of medical substances was effected and the voluminous treatises and works on materia medica were collected and interwoven into that branch of medical science.

With the progress of medicine towards exactitude, and the impetus given to it by closer methods of examination into the causes of its effects in all its various branches, physicians began to cultivate a chemical knowledge of the hundreds and hundreds of substances employed in the application of the healing art, till finally they began to inquire into the composition and minute anatomy of the drugs and to search out reasons for the diversity of actions presented by the various drugs. Analysis then took a hand in the work, and threw its search-light into the shadowy recesses, and sought to dispel the mists. To say that the results were signal is but to voice a platitude. Chemists began to analyze everything used as therapeutics, and they found that drugs regarded as simple by our medical ancestors exhibited a chemical structure so complex as to almost baffle their efforts, but time and perseverence served to untangle the intricacies and bring order out of chaos. Side by side with materia medica, then, was built up the enduring monument of organic chemistry, and to its achievements and the work of its exponents belong all the science —all that is exact and scientific.

Then, and not till then, was it determined that medical substances having more than one action, and hence more than one use, contained in their chemical anatomy more than one group or combination of elements. It was likewise learned that a great many of the more potent drugs contained in their chemical interior, active principles responsible for the therapeutical phenomena brought out in their action, and that the active principle of a single drug constituted only a small portion of the crude drug. It was also demonstrated that many of the drugs were masses composed of groupings of several of these powerful active principles, and that they owed their peculiarities and characteristics to aggregations of these potent factors. To illustrate, I have but to mention the drug opium. At first blush it would seem but a simple medicine, but when you consider that it is a bulk in whose composition there are eighteen or more distinct and separate alkaloids, each having its own chemical formulæ and its individual physiological effect, you will cease to regard it in such an elementary light. Even the sum total of the alkaloidal bases in it does not account for its entire body, as, besides these active principles, there are other organic substances, or groupings of elements that contribute much towards its construction.

Opium is but one good example of the complexity of formulæ concerned in the make-up of many substances belonging to materia medica. Numerous other substances are equally as complex.

Chemical analysis has added tenfold to the armamentarium of the physician by splitting up compound substances into component simpler compounds, and thereby multiplying each drug so treated, but this is not its most important work. By resolving complicated formulæ into simpler formulæ it has, by inspecting these formulæ, laid the foundation for the new chemical materia medica. To explain:—These simpler groupings of ultimate elements are closely analyzed and it has been discovered that when certain elements exist in combination, with certain other elements, and when administered, they produce certain effects. By close study of the elements occurring in combination in certain proportions to each other, it has been made possible to artificially bring together these same elements in similar proportions, and to make medicines in the laboratory which are as effective as the natural products furnished by analytical decomposition of nature's remedies. What may be more astonishing, but is nevertheless true, is the fact that in many instances these synthetical, or artificial compounds can be made much more active than the natural compounds resulting from the decomposition of natural substances. Chemists, who are also learned in medicine by clinical experience find that a combination in a great measure owes its utility to one or two of its composing elements, and when they reproduce a similar compound, by synthetical process they naturally increase, if possible, the element responsible for the use of the compound. To give you an illustration of this principle, put into practice, we will study iodoform. Iodoform is a simple compound of the organic base formyl and iodine and has a formula expressed, $CHI_3$. The usefulness of iodoform depends entirely upon the iodine. The iodine alone exerts the antiseptic power. It was desired to have a compound containing iodine in such an amount and in such a loose condition of union that when applied to the tissue the iodine would be liberated gradually and exert its antiseptic power continuously. Had the chemist made his compound so that the iodine was united with another base in which the union was more tenacious the iodine would not be let loose to do its work. Did the compound contain less iodine, the condition of affairs would not favor its liberation. Pure iodine would be too powerful and would be out of the question. Here is where your educated chemist had a chance to exercise his ingenuity, and by thought he produced the ideal compound—a compound which would when applied to the tissues allow enough iodine to volatilize continuously and exert its salutary action, and yet volatilize only fast enough to do good without irritating the tissues too much by furnishing the iodine in too large a quantity.

By this time it is patent to you that by chemical analysis the chemist has discovered the very fountain head. He has found that complex structures owe their virtues to simpler compounds of elements, and that in many of these lesser combinations the essence is in one single element. So much for analysis, which while being the real foundation of the edifice is not the structure itself. Synthesis, synthetical chemistry, is the giant that is revolutionizing materia medica and furnishing the hundreds and hundreds of new substances all of which are chemical products, pure and simple, and are being manufactured to accomplish remedial purposes and directed against all the pathological conditions the diagnotician can detect. Most of the inorganic salts used in the practice of medicine, are the foot-prints of this Colossus in the past, the coal-tar derivatives are its present progeny, and who knows what an infinite variety may be its future product? Our wildest speculations would not serve to measure the onward march of progress this great factor, synthetical chemistry, is making and will make. Thousands of chemical drugs, representing a scale of graduations too minutely fine to imagine, are to be added to materia medica.

Chemistry, as a branch of medical education, has been relegated to the darkest corner in the college curriculum of most institutions; but the time has arrived when a thorough and accurate knowledge of chemistry is absolutely essential to an understanding of drugs and their uses. Materia medica is to be enormously developed, but mainly through the development of organic chemistry. * * * * *—*Detroit Emergency Report.*

## New York Academy of Medicine.

D. B. ST. JOHN ROOSA, M.D., PRESIDENT.

### SCURVY IN CHILDREN.

DR. W. P. NORTHRUP read a paper with this title. He said: The first case of scurvy I ever saw died, but the autopsy in this case did something to advance our knowledge of this subject. In 1873, a case of infantile scurvy in a child eighteen months old was reported by a continental observer. In the *Lancet* for November, 1878, by W. B. Cheever, of London, appeared three cases of scurvy supervening upon rachitis in young children. The writer first saw a case of this kind in the New York Foundling Asylum in 1889. It was not known to have scurvy, and did not receive proper dietetic treatment. The least affected leg in this case showed hemorrhage about the femur and tibia. The other leg was very much worse, the lower end of the shaft of the femur was separated from the epiphysis, and the bone looked as if it had been boiled for some time. This case was reported to the New York Pathological Society in 1889. The diagnosis was made from the post-mortem findings. Two years later the writer met with a typical case in consultation. The patient had the best of surroundings, and the case was diagnosticated early and promptly treated, so that it was well in thirty days. I then collected in New York City and elsewhere nine other cases.

Scurvy is plainly a disease of mal-nutrition dependent upon long use of improper food, and the absence of fresh food or fresh fruit juice. Its most characteristic symptoms are spongy gums and a tendency to hemorrhages—notably sub-periosteal collections of blood about the femur and other long bones. There may be hematemesis, hematuria, and bloody stools.

A child sixteen months old, surrounded by everything wealth could bring; both parents extremely robust and healthy. The child was breast fed for a few months, and was then fed on "prepared babies' food." Dentition occurred at the usual time, but the child was backward in walking. After being fed for twelve months on this food, the gums were noticed to be unhealthy looking, and a week later the joints of one extremity became swollen and tender. When seen in consultation, the gums were very much swollen and hemorrhagic. It could move the right leg only slightly, and the right thigh was the seat of a fusiform swelling just above the knee. There were no other external manifestations. The child was sent to the country and given fresh cows' milk, and orange-juice. The latter was taken greedily. Improvement was immediate, so that in ten days the gums were entirely normal, and the thigh was very much better. One month later the child was standing on its feet.

In my paper on this subject, read at Washington, in September, 1891, I reported twelve cases of scurvy in children. In eight of the cases the age of the children ranged from eleven to eighteen months; the others were from two and a half to six years of age. The temperature in these cases did not exceed 101°. Various causes were assigned—prepared food, condensed milk, exclusive feeding for some time on prepared food, and exclusive diet of meat for three months. One observer states that in two cases he succeeded in isolating a slightly curved bacillus; and when rabbits were inoculated with these bacilli there were extravasations of blood in various parts of the body, but the organism could not be found in the fluids of the body. Inoculations with pure cultures of these bacilli in large quantity, gave rise to abscesses and death. The reporter expresses the opinion that the organism is ordinarily found in the mouth, and in cases of mal-nutrition finds a favorable soil. In the treatment of successful cases orange-juice and fresh milk seem to bring about the most prompt improvement. In one case in which the administration of acids was combined with that of iron, recovery took place, but more gradually. The internal administration of chlorate of potash in one case for several days caused no improvement, but the patient rapidly recovered when given orange-juice which was taken with avidity.

Scurvy is a condition of mal-nutrition which affects the capillaries, allowing the blood to escape from them, probably by diapedesis. This also causes sponginess of the gums. The collections of blood occur most often about the shafts of the femora and beneath the periosteum. The next most frequent are petechiæ and ecchymoses of the skin, often in the eyelids.

The second year of life is the most common period of scurvy. The disease is believed to be a distinct entity, although often associated with or superadded to rickets. Formerly it was believed to be so closely associated with rickets as to justify the name "acute rickets."

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## Increasing Longevity.

"The threescore and ten years allotted to man will yet be increased to twice that number," was the prediction made by Dr. Charles Hienkle. "Instead of the world growing weaker and wiser, as the old axiom puts it, it is growing wiser and stronger. The average length of life is steadily increasing. In the days of good Queen Bess women were considered passe at thirty, and few men distinguished themselves in state-craft, science or literature after passing five and sixty. Now a woman is in the heydey of her beauty at thirty, and the ripest fruits of genius are frequently plucked at threescore and ten. Gladstone, Bismarck and Blaine are fair examples of that green and fruitful old age so frequent in these days. Yet science is but in its infancy. As it progresses the waste of life and energy will be gradually curtailed.

"While the fountain of youth sought by that interesting old crank, Ponce de Leon, will probably never be found; while man will probably never discover the secret of remaining an ever young Apollo, nor woman that of being as attractive at sixty as at sixteen, I firmly believe that the meridian of life will yet be raised from thirty-five to seventy; that the day will come when a man will not be considered a back number when he has reached his 100th birthday."—*St. Louis Globe Democrat.*

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OFFENSIVE ODOR OF THE BREATH may be overcome by the habitual use of Eucalyptus and Thymol Antiseptic. Add a teaspoonful to a tumblerful of water for a mouth-wash and gargle. For bad breath caused by gaseous eructations of indigestion, Eucalyptus and Thymol Antiseptic is an excellent remedy, in doses of twenty to thirty drops in a little water.

## Sir Andrew Clark—A Reminiscence.

Miss Frances E. Willard writes the following interesting account of her visit to Sir Andrew Clark.

Although it is true that the article closes with a reference to a well-known preparation, yet the merits of the preparation itself warrant such a notice. Besides this the article is a most interesting one, in that it gives the best description we have seen of this great physician; his methods; and his directions for general treatment:

"This chief among the great physicians of London has just passed away in the sixty-seventh year of his age. He was Tennyson's physician and Gladstone's; indeed, so great was his fame, that when, two weeks ago, he was stricken with paralysis, seven hundred messages of inquiry came to his family in a few hours. He was a small, slight man, of what we call the wiry type, and a remarkable illustration of what 'mind cure' can do for a person who is determined to live whether or no. It is said that forty years ago, when he sought admission as a physician in one of the London hospitals, the choice fell upon him in preference to a number of equally eager aspirants, on the basis that he was a 'delicate little fellow and would not live long anyway.' He was condemned to death in his youth by the verdict of physicians, but eluded the same by a novel process: he flung himself into the hardest kind of work, paying no attention to his fears and concentrated his forces altogether on his hopes.

"When I went to see him, he extended a hand white as a lady's and soft as velvet, and in a voice that matched the hand, went into a most careful diagnosis of my case; beginning with heredity and ending with the last morsel I had tasted that morning. He followed me through every lane of life, ancestral and individual; carefully examined my lungs and heart, saying (I think this was part of his mind-cure process), 'beautiful lungs, beautiful heart, no organic difficulty, over-work, nervous exhaustion. What you need is rest, pure air, cheerful companions, simple diet and no end of outdoors.'

"His manner was most reassuring and had in it a tender considerateness hardly to be expressed. When he asked to take the pulse or see the tongue, he prefaced the request with the words, 'My dear patient.' It was apparent that not only great skill and high character, but a most fortunate manner were the essentials of his success. He prescribed no medicine whatever, saying that he thought very little of it, and that old Mother Nature was the only true physician, and gave me some simple rules which seemed to me so good that I have had them copied for the benefit of any who may care to profit by the wisdom of a man both great and good, and a physician of unrivaled fame.

"At my request he wrote down three aphorisms he had used during our interview; 'Labor is the life of life;' 'Ease is the way to disease;' 'The highest life of an organ lies in the fullest discharge of its functions.' Here follow what he called his temporary general instructions;

"'On first waking in the morning sip about half a pint of water, cold or hot; on rising take a tepid sponge bath followed by a brisk general toweling. Clothe warmly and loosely. Avoid chilled, damp and passive exposure to cold. Take three simple, nourishing meals daily, and nothing between them. Breakfast at 8 to 9; plain or whole meal bread, or toast and butter with eggs, or fresh fish, or cold chicken, or game or tongue, fresh, not preserved, and toward the close of meal about half a pint of tea not infused over five minutes, or of cocoatina, or of coffee and milk.

"'Dinner from 1 to 2 o'clock; fresh, well-dressed meat, bread, potatoes, some well-boiled green vegetables, if it agrees, and either some simple farinacious pudding, or some simply cooked fruit. Toward the close of the meal drink water.

"'High tea five or six hours after dinner; whole-meal bread, or toast and butter, with broiled fish or cutlets, or a chop or cold meat, or cold chicken, and toward the close of meal about half a pint of black China tea, not infused over five minutes; cocoatina or cocoanibs may be substituted for tea if it is preferred, and if it agrees.

"'Nothing after this meal except that on going to bed you may sip a tumbler full of water, hot or cold.

"'Avoid soups, sauces, pickles, spices, salted, smoked, or otherwise preserved foods; pies, pastry, cheese, creams, ices, jams, dried fruits, nuts, raw vegetables, compotes, confectionery, malt liquors, cider, ginger beer, much liquid of any sort, and all sweet, sour and effervescent drinks.

"'Walk at least half an hour twice daily.

"'Retire as soon as possible after ten. See that your room is airy. Avoid self-notice and self-distrust. Shun ease and lead a full and regular, and an occupied life.

"'Whenever you have to speak at night be sure to lie down for an hour before tea.

"'Take nothing between meals.

"'Never take a sleeping draught.

"'Take as little medicine as possible; accept your sufferings; strength is perfected in weakness; in labor you will find life. If you are terribly run down some time, go away for a fortnight's rest, and with each meal take a teaspoonful of Fellows' Syrup of Hypophosphites.'"—*The National Medical Review.*

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## Improved Cleft Palate Operation.

BY MR. DAVIES-COLLEY, LONDON.

An improved method for operating for the cure of cleft of the hard and soft palate. The operation may be divided into three stages:

1. An incision is made down to the hard palate in front, and behind through the soft palate, with its centre just internal to the last molar. With a raspatory the muco-periosteum is separated by first incision inward. An incision is made about a quarter of an inch from the cleft in front. It runs parallel to the cleft backward, and is continued to the tip of the uvula, splitting the soft palate to the depth of about three-eighths of an inch in front, and a less amount behind. The muco-periosteum between this incision and the cleft of the hard palate is separated inward with the raspatory as far as the edge of the bone. A

triangular flap is raised from the other side of the palate, in such a way that the anterior extremity is free, and the inner margin runs parallel to the edge of the cleft at a distance of one-sixth of an inch. In the soft palate the incision is continued backward so as to split that structure in the same way as on the other side. The muco-periosteum of the hard palate is separated inward and left attached to the edge of the bone.

2. The mesial flaps are united by fine silk or catgut sutures; and continuously with this union the upper planes of the split soft palate are brought together. A bridge is thus formed across the whole cleft with a mucous surface directed upward, and a raw surface downward.

3. The edge of the triangular flap in front, and of the lower plane of the soft palate behind, is united by silver wires and one or two silk sutures to the edge of the hard and soft palate of the other side. A second bridge is thus formed across the whole cleft, with a raw surface looking upward and a mucous surface downward.

The after-treatment is that of the ordinary operation, except that as there is no tension in the hard palate, and very little in the soft, the sutures may be left in from three to six weeks.

The advantages claimed for this operation are:

1. No tissue has to be pared away.
2. A much larger extent of raw surface is brought into close contact than in the ordinary operation.
3. The tension is small.
4. The upward pressure of the tongue is beneficial, as it presses the lower against the upper bridge.
5. Some advantage is gained by using the muco-periosteum of one side in *front* of the cleft to help in bridging the gap of the hard palate.

The only drawback to the operation is that the application of so many sutures makes it rather longer than the ordinary operation.

In each of the six cases upon which Mr. Davies-Colley has employed this method, union has been complete over at least four-fifths of the cleft.—*Cincinnati Lancet-Clinic.*

## Can Women Farm? 56,800 Women are Farming in America.

America had in 1890, 2,700,000 breadwinning women and girls working outside of their own homes. There were 110 lawyers, 165 ministers, 320 authors, 588 journalists, 20,061 artists, 2,136 architects, chemists, pharmacists, 2,106 stock raisers and ranchers, 5,135 government clerks, 2,538 physicians and surgeons, 13,182 professional musicians, 56,800 farmers and planters, 21,071 clerks and bookkeepers, 14,465 heads of commerical houses, 155,000 public school teachers (based on the census of 1880).—*Woman's Journal.*

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## The Influence of Odors upon the Voice.

You may, perchance, some day give a *soiree musicale*, as all fashionable people have the right to do, and you will be astonished to note how your singers will insist that no flowers shall be permitted to decorate your parlor; this will appear odd, too, when you first give the matter attention, and you will say to yourself: "How strange these musical people are!" But singers are not like the rest of the world; they seek to appear *singular* above all things. You might well say at the start, they are *originals.* They can only be compared to spoiled children, whose faults we pardon in view of the great pleasure they give us. That is the way the world and the average opera manager feels, and such criticisms are unjust and severe.

Flowers, and all perfumes in general, exercise an injurious influence on the vocal cords. There is no doubt about this fact, and, though rarely described, this peculiarity has been observed many, many times. What led us to study this question of the influence of odors upon the voice may be easily explained; *it was curiosity.* One day there fell under our eyes a "leaf" from a journal, on which was portrayed an etching. This person was an actress; her picture, like her name, need not be mentioned. She had a thousand good qualities and very few faults. We read the sketch of her life along with her etched face. This informed the public that she detested the odor of amber and musk and all other strong odors, and her listeners were warned not to perfume themselves when attending her concerts, because she believed, "according to Monnet Sully, that perfumes broke one's voice." —*The Cincinnati Lancet-Clinic.*

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## The Prevention of Disease.

A paper on this subject was read before the New York Academy of Medicine at its general meeting, Feb. 1, 1894, by W. W. Potter, of Buffalo, N. Y. He said :

The highest office of the physician of modern times is, and ever must be, in the exercise of his functions toward the prevention of disease. Every one is, or should be, interested in this subject.

The physician must be prepared to offer an intelligent opinion as to the best methods of preventing the spread of cholera, smallpox, etc., etc., as well as on questions pertaining to plumbing, sewerage, drainage, ventilation, and every detail of house sanitation.

Happily, however, some of the exanthematous fevers have not now the same dread as formerly, since the triumph in medicine in solving the methods of their prevention and cure. But a number of maladies, that formerly were not thought to be contagious or infectious, are now known to be so through the investigations of clinicians and bacteriologists.

Taking as an example consumption. While it is true that much has been done of late to control its spread, yet how many physicians are ready to admit that it is an infectious malady, and that it may be conveyed to a healthy person ?

In order to prevent the spread of this direful disease effectively, it would be necessary to establish an absolute inspection over all milch cows, their feed and stabling and over all animals that are slaughtered for the purposes of food, to the end that every tuberculous beast shall be killed and its body cremated.

The quantities of tuberculous food consumed are enormous, and it will require the most rigid system of inspection and supervision by most skilled, honest and well-paid officials to stop traffic in these dangerous and unwholesome aliments.

Another important step toward the prevention of the propagation of consumption consists in the prohibition of the intermarriage of tuberculous subjects; for a man with existing tubercular disease to marry a woman of tubercular parentage would be tempting providence. The off-spring of such a marriage, to say the least, would offer a favorable soil for the growth of the tubercle bacillus. Still another step in the direction of prevention consists in the establishment of separate hospitals for consumptives, and the adoption of measures looking toward their isolation. The sputum of the consumptive constitutes a focus of special danger. To deal intelligently with the question of prevention the sputum must be sterilized as soon as thrown off.

Without doubt, independent of the infection by food, the most serious menace comes from the respiration of infected dust, and the one great means of infecting dust is through the sputum of consumptives. The author is of the opinion that it will be yet just as possible to quarantine and control the method and habits of life of the consumptive patient as it is now of a small-pox, yellow fever, or cholera patient. At all events, he hopes that an enlightenment of the people on this subject will lead to such results.—*American Medico-Surgical Bulletin.*

## The Price of Glass Eyes in England.

The best glass eyes are made in Paris, where patients are generally sent who are anxious for a perfect match; but excellent ones, at a much lower price, are made in Birmingham; and if care is exercised in the choice, a perfect match can generally be obtained. Lately German eyes have been supplied to many hospitals, costing wholesale only about 2s. 6d. each. A stock of three hundred of these is sufficient for ordinary work, and they can be supplied to poor patients for four or five shillings each—an immense blessing, as many a mill girl and factory hand can testify.—*London Tit-Bits.*

# NOTICES.

## The Kentucky State Dental Association.

The twenty-fourth annual meeting of the Kentucky State Dental Association will be held at the Louisville College of Dentistry, Chestnut street, Louisville, on Tuesday, June 19, 1894, continuing in session three days.

A very interesting programme has been arranged for this meeting, including papers and discussion on the following subjects: "Formaldehyd;" "Secret Nostrums—Their Effect on Patient and Profession;" "Dental Parasites"; "My Mistakes;" "Dentistry in South America;" "Are Professional Lies Justifiable?" "A Few Practical Points;" "It Is Amusing." Other papers have been promised by the following members: Dr. A. Wilkes Smith, of Richmond; Drs. E. C. Dunn, E. M. Kettig, H. B. Tileston and A. B. Weaver, all of Louisville.

The clinics will also be of a very important and instructive nature, and the Executive Committee will see that all new appliances and methods are properly brought before the meeting.

All reputable members of the dental profession are cordially invited to be present at this meeting. "Come and bring your friends; the association is always glad to welcome visitors."

The State Board of Dental Examiners will hold their meeting during the session for the transaction of such business as may come before them.

Arrangements have been made with the proprietors of "The Fifth Avenue Hotel" and "The Willard" by which delegates will receive reduced rates.

For further or special information address any member of the Executive Committee, or

DR. J. H. BALDWIN, Secretary,
615 W. Chestnut st., Louisville, Ky.

The Executive Committee take great pleasure in stating to members and visitors, that through the kindness of Col. C. P. Atmore, General Passenger Agent, L. & N. R. R., arrangements with lines terminating here for one and one-third fare, on certificate plan, have been secured. Purchase tickets to Louisville and procure certificate from railroad agent, showing regular ticket has been sold, etc. Dr. J. H. Baldwin, our Secretary, will certify as to attendance, and presentation of such certificate to agent at Louisville, within three days after adjournment, will secure special return ticket at one-third fare, to points in Kentucky.

B. Oscar Doyle,
Secretary Executive Committee.

June 2, 1894.

## Illinois State Dental Society.

Chicago, May 21, 1894.

At the thirtieth annual meeting of the Illinois State Dental Society held at Springfield, May 8 to 11, 1894. the following officers were elected for the ensuing year:

J. W. Cormany, Mt. Carroll, President; S. F. Duncan, Joliet, Vice-President; Louis Ottofy, Chicago, Secretary; W. A. Stevens, Chicago, Treasurer; Grafton Munroe, Springfield, Librarian. The next meeting will be held at Galesburg, May 14 to 17, 1895.

Louis Ottofy, *Secretary*,
Masonic Temple,
Chicago.

## The Indiana State Dental Society.

The annual meeting of the Indiana State Dental Society will be held on Tuesday, June 26, 1894, at Lake Maxinkuckee, Indiana, and will continue in session three days.

The State Board of Dental Examiners will meet at the same time and place.

A cordial invitation is extended to members of the dental profession.

G. E. Hunt, Secretary,
Indianapolis.

# EDITORIAL.

## A Change in the Dental Law of Ohio.

On the morning after the adjournment of the recent Legislature of Ohio, the newspapers contained the following notice:

"Mr. Lane's Dental College Bill, after much toil and tribulation, became a law in the Senate this morning. While intended to cover the special case of the Ohio Dental College, on Park street, Columbus, the bill is general in application, and will also prove of benefit to a small dental college in Cleveland."

This action of the Legislature seems to have been so hastily and so quietly done as to escape the notice of the Dental Profession, except a very few who were specially interested, or thought they were.

The amendment as given below has some good points, especially, so far as it refers to dental college requirements; in this particular it is an improvement on the law that was enacted two years ago. The chief aim of this amendment, so far as it appears on its face, is to define what constitutes a reputable dental college. This, under the former law, devolved upon the State Board of Examiners; this amendment relieves the Board of this responsibility. It can not in any wise affect any graduates who go from Ohio to any other State to practice.

If the State Board is careful to fully secure full and complete knowledge of the various colleges whose graduates present themselves for registration, this amendment will be helpful rather than otherwise. This enactment will stimulate to closer scrutiny, especially of the colleges whose methods are not fully known.

SECTION I —*Be it enacted by the General Assembly of the State of Ohio*, That Sec. 4,404 of Revised Statutes, as amended April 8, 1892 (87 O. S. L. p. 237), be supplemented as follows, with sectional numbering 4,404 A :

Sec. 4,404, That for the purposes of this Act, Colleges of Dentistry shall be regarded as reputable which are under State control, or are organized, controlled and governed by a Board of Trustees, as provided by law for governing colleges of medicine, which possess buildings, by lease or otherwise, and equipments valued at not less than five thousand dollars, which have a graded course of not less than three years, the time of instruction in each year being not less than six months, and which have a curriculum which includes anatomy, physiology, histology, pathology, chemistry, microscopy, materia medica, metallurgy, operative, mechanical and surgical dentistry.

Sec. II.—This act shall take effect on and after its passage.

Alex. Boxwell,
Speaker of the House of Representatives.
Andrew L. Harris,
President of the Senate.

Passed May 21st, 1894.

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## The American Dental Association.

The annual meeting of the American Dental Association will be held at Old Point Comfort on the first Tuesday of August next, and the indications are that there will be a very large meeting; that is a very attractive and pleasant place for the meeting.

The reports are that extensive preparation is being made by a large number of the membership for work at that meeting.

Persons going to the meeting either from or through Cincinnati, will find the Chesapeake & Ohio Railway by far the most desirable route, and this is the only direct way. The best train for the party to take is the Number 4, which leaves Cincinnati at 7 o'clock P. M. This is a solid vestibule train, and has a through Pullman sleeper from Cincinnati to Old Point Comfort, arriving there at 6 P. M. the following day. This train will give the party the benefit of the Alleghany and Blue Ridge Mountain scenery, Shenandoah and Piedmont Valleys in the day time, and on the return trip the corresponding train can be taken at Old Point, arriving at Cincinnati at 5 P. M. the following evening.

The fare for the round trip will be fifteen ($15.70) dollars and seventy cents. Arrangements have been made with hotels for reduced rates, so that the opportunity for a visit to this delightful place will be afforded at a very economical cost. Let every member go and take his family.

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FOR the benefit of those who may be at a loss as to a form for a professional card the following, which came to hand a few days ago, is a veritable sample, with the name and location slightly changed:

"DR. JOHN BENNINGTON,

GENERAL-TOOTH-DENTIST,

Watchmaker-and-Jeweler.

GLEN ROVER, TENN."

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## Bibliography.

CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY FOR 1893. B. H. Catching, D.D.S., Editor and Publisher, Atlanta, Georgia.

This work, just issued, embraces a very complete record of the valuable material of our journalistic literature for the year 1893, and, as a work of reference for the busy dentist, is of very great value.

It embraces not only the matter of the journals in the English language, but also that of those of other languages as well, which constitutes a very valuable addition to the work.

The preparation of such a work involves a great amount of labor in reading and collation. Such a volume is a very great addition to the library of the dentist, and should be in the hands of every dentist who desires to have most ready access to the valuable matter contained in our journals. We cannot too highly commend this work to the attention of the profession.

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## Obituary.

From a letter just received from Dr. N. W. Williams, of Nice, France, the word comes that Dr. Henry Shelley, an American dentist, of 33 Boulevard Haussmann, Paris, France, committed suicide, April 12th, shooting himself through the head with a revolver.

Dr. Shelley was about forty-two years of age, and though in comparatively good health had suffered with mental depression for some years. He graduated from the Ohio College of Dental Surgery about the year 1872. He was a man of good ability, but even at that time was subject to times of mental depression, and undoubtedly this peculiarity ultimately became the occasion of his death. He had accumulated a considerble amount of money and property, for which he has no heir in France. His people once lived, we think, and may yet, in Richland county, Ohio. If this notice should come to the knowledge of any of the members of his family it would be to their interest to look after the matter.

Any friends of Dr. Shelley wishing to communicate in reference to the matter can write to Dr. N. W. Williams, of Nice, France, or to Mr. Allain, Attorney, 8 Rue Florentine, Paris, France.

# THE DENTAL REGISTER.

VOL. XLVIII.] JULY, 1894. [No. 7.

# COMMUNICATIONS.

## Chloroform and Ether.

BY C. G. DARLING, M.D.

Read before the Thirty-eighth Annual Meeting of the Michigan Dental Association.

Nearly half a century has passed away since Wm. G. Morton, an enterprising dentist of Boston, first made use of ether as an anæsthetic, and scarcely less time has elapsed since James Y. Simpson and his friends sat down together to make a practical test of the anæsthetic properties of chloroform.

That these anæsthetics were enthusiastically received and used by the medical and dental professions we can well believe, and that they have so long maintained the place which they now hold in the practice of dentistry when so many local anæsthetics have been brought to notice is a lasting testimony in their favor.

The fact that chloroform was first used in Europe may have influenced the profession of that country to stand so strongly for it and prefer it to ether, but that preference which at one time seemed to be gaining a strong foothold in the United States is fast giving way, and chloroform no longer maintains the place which it once held with ether. That these anæsthetics were at first used indiscriminately, and with little knowledge of the process by which they produced the anæsthetic effect, much less the cause of alarming symptoms, is fully proved by the number of deaths which were soon brought to notice, and the energetic manner in which physicians began to inquire into the cause of death from anæsthesia.

In order that we may judge correctly of the importance of anæsthesia to the profession, I will quote from an edition of Furgeson's Surgery published in 1853.

"A vast and important change has come over the department of operative surgery since the last edition of this work was published. The discovery of anæsthesia as a means of causing insensibility to pain during the performance of surgical operations has been made in the interval, and now instead of wild outcries or stifled screams and groans coming from the patient under the surgeon's instruments, he may be made to lie as quietly as if in a calm sleep, or possibly during the most painful applications of the knife under other circumstances, he may be mentally engaged in the most pleasing associations of thought, or singing or humming by snatches some favorite air."

Still further in this chapter he mentions the dangers and the fact that deaths have already occurred from its use.

The giving of an anæsthetic in those days was entrusted to a man of large experience, one who was able to judge of the condition of patients and the proper method of administering the anæsthetic. The fact that now and then a patient would die while the anæsthetic was being administered led to extensive experiments that some chemical agent might be found to take the place of chloroform and ether, an agent that would be a good anæsthetic but at the same time not dangerous to life; but the work did not meet with good success, not even to the present day. There have been hundreds of deaths reported in those forty-eight years to say nothing of the large number of deaths about which nothing has been said. Lyman has collected three hundred and twenty-three cases of death from chloroform; in thirty-five cases the anæsthetic was administered for tooth extraction, and twenty more died during self-administration. Only twenty-seven deaths from ether had been reported before 1881, none of these for tooth extraction, probably because it was so little employed for that purpose. One hundred and thirty deaths from chloroform were reported from 1880 to 1889. Nine cases were reported for the year 1889 in the journals. One case was in a dental office. The dentist was sued for $5,000, but fortunately for him, the jury disagreed.

Perhaps the latest and most valuable statistics concerning anæsthesia are those reported by Gurlt in the *Archives fur Klinical Chirurg.*, 1893. These cover 50,062 cases of administration with eleven deaths, being one death to every 4,551 cases. All the general anæsthetics, excepting nitrous oxide, are included in this list. The average of chloroform was one death in 2,097 cases, while from ether it was one in 14,646 cases, and this patient died three hours after amputation of both forearms before recovery from the shock of the accident had taken place. The writer concludes his report by saying:

"These quotations leave no doubt that we possess in ether the most harmless and most efficient anæsthetic for all purposes, and that it is our duty wherever human life is concerned to return, when our better judgment tells us, to that anæsthetic with which the era of surgical anæsthesia opened, and to abandon those that have so often endangered life."

Dr. Ormsby, of Dublin, thus graphically describes a death from chloroform which he saw administered: "The man gave but two or three inspirations when he died as suddenly as if shot through the heart. There was no sign of impeded breathing, no pallor of the cheek—in fact, no warning whatever. Never shall I forget the consternation of those concerned! and no wonder, for here was a man in the plenitude of life and apparent vigor, cheerful in spirits, changed, with the appalling suddenness of a lightning flash into a corpse! All means of resuscitation were promptly resorted to but in vain, the man was dead." Yet he tells us that the man had been examined and his heart found perfect but a few moments before the anæsthetic was administered, and the reason assigned for giving chloroform was that he behaved badly under ether which had been administered for some previous operation. This case describes what takes place in a large majority of deaths from chloroform.

The findings of the Hyderabad Commission concerning the use of chloroform have become so well accepted in a general way, that I will take from them freely and make the necessary comments afterward.

The first committee appointed by the Nizam's government, arrived at the conclusion that chloroform arrests the respiration before stopping the heart's action. The *Lancet* would not accept these conclusions, and a second commission was appointed with a representative of the *Lancet* as a member, to test the conclusions of the first and they were found to be correct. The object of this commission, briefly stated, was to test the safety of chloroform in comparison with ether and A. C. E.; the result, if the anæsthetic is pushed to a dangerous degree; the liability to syncope by shock or fatty degeneration of the heart, also the effect of anæsthetics on different animals. While the administration of anæsthetics to animals can hardly be considered a fair test for their effect on man, we will consider their conclusions.

Chloroform freely diluted with air when administered brought about a gradual fall in blood pressure, and the more diluted was the anæsthetic the less rapid was the fall. This fall did not cease when the chloroform had been stopped, because of absorption of residue in the air passages. Respiration may, therefore, cease after the chloroform has been withdrawn. Struggling causes rapid inhalation and, as may be expected, there is rapid fall of blood pressure. The close application of the cone at this time also increases the danger. The controlling action of the vagus upon the heart is its safeguard; it is the temporary exhaustion of the vagus, after stimulation, that proves dangerous. Their experiments give us no new light upon the cause of primary syncope. The value of pulse, color, temperature, pupil and conjunctival reflex, have received little attention at their hands. While fear and shock, such shock as comes only to the human body, largely, it may be, because of anticipation, can not well be studied upon animals, although their experiments contrasted markedly with those occurring in the human subject under similar circumstances. That the danger depends largely upon the dose and that as in other remedies, no two persons require the same dose is probably true; it should then be administered according to the well defined rules which were laid down by the commission, which in substance, are as follows:

1st. The recumbent position on the back and absolute freedom of repose are essential.

2d. That attention to the respiration is necessary to prevent asphyxia when the patient is not in the recumbent position.

3d. If the patient struggles be careful not to interfere, in any way, with respiration when it becomes necessary to hold him down.

4th. Any apparatus which is made to fit the face is an element of danger in the administration of chloroform. And that method of administration only should be used that will admit an abundance of air.

5th. At the commencement of inhalation the cone should be held at such a distance from the mouth or nose as will not cause excitement, struggling, or holding the breath; for if these occur the deep inspirations which follow may cause an overdose. When the patient begins to breathe quickly, the inhaler will be brought closer to the face provided that it does not interfere with respiration. When the patient struggles, cries, or holds the breath, a little fresh air should be admitted, for the deep inspirations which follow, as under such circumstances one or two inhalations of chloroform may be sufficient to produce complete insensibility. The patient is ready for operation when the corneal reflex is abolished, that is, there is no response when the eye is touched with the tip of the finger. He is kept under the anæsthetic by occasional inhalations, and should not be allowed to recover sufficiently to struggle or resist. If we wish to avoid death from shock or fright, the operation should not be commenced until the patient is fully under the influence of the anæsthetic. The administrator should watch the chest and abdomen, and note each respiration. If there is any difficulty of breathing, or the breath is held, the inhaler should be removed until the breathing is again natural. When this does not promptly take place the lower jaw should be pushed forward, the tongue drawn forward, the head lowered. Should this not be sufficient, artificial respiration should be commenced and continued until the breathing is once more natural. Morphia by subcutaneous injection may be given before the anæsthetic in prolonged operations. Alcohol may be given to steady the nerve and increase the confidence.

The Commission ventures the statement that if these rules are strictly followed chloroform may be administered with absolute ease and perfect safety. Without doubt this statement has increased the confidence of the medical profession in the use of chloroform as an anæsthetic, for we find that in the last two years the death rate from this anæsthetic has increased.

The person who is to administer ether should provide himself with a properly constructed cone, one that admits enough air to the respiratory passages to sustain life, not so large an amount as will too much dilute the vapor of ether, as this will greatly retard anæsthesia. When a cone made from cloth and paper is used, the border must be lifted from time to time to admit fresh air. The Allis inhaler is perfectly safe and the amount of air which enters can be regulated by closing the top. The anæsthetizer should provide himself with a forceps for drawing the tongue forward, a gag for separating the jaws, and a mounted sponge for cleansing the pharynx of mucus, for in some cases much mucus will collect. He should have previously examined the heart and lungs to see that they are in a proper condition, and it is always well when there is any suspicion of disease of the kidneys to have the urine examined, because a fatal suppression now and then takes place, especially in cases when the anæsthesia is prolonged. The respiration should not be interfered with in any way, all constricting bands of clothing about the neck and waist should be loosened. The patient should then be laid down upon a couch, table or chair, which will let him assume an easy recumbent posture. No food should be taken for at least four hours before administering ether, because of the liability to cause vomiting. Milk also should be prohibited, as it may add to the danger. It is always well to explain the action of the anæsthetic to the patient, that the first inhalation may cause coughing and a feeling of suffocation, not at all dangerous, and that it will soon wear away. He is instructed to take deep inhalations and to put away all fear.

When the operation is a short one, or the operator works rapidly, primary anæsthesia will suffice, and with a good patient who will obey instructions the operation may be completed in four minutes from the time of beginning the anæsthetic, but the word must be given at the proper moment, or the opportunity is lost until complete anæsthesia is induced. For complete anæsthesia, a large amount of ether is applied to the cone, the patient is instructed to breathe deeply and rapidly, not even a breath of unnecessary air must be allowed to enter, but an atmosphere heavily laden with ether must be rapidly inhaled by the patient. When, however, the operation is quite extensive, full anæsthesia is to be induced. This can be determined by raising the eyelids without resistance or touching the cornea without response. Ether anæsthesia, when complete, will last from two to five minutes, much longer than chloroform, thus giving ample time to perform an extensive extraction without renewing the anæsthesia. It is always well to let the patient become slightly conscious after the first profuse anæsthesia in order that the blood falling back into the mouth may not interfere with respiration. I have seen patients sufficiently aroused to open the mouth when requested and have several teeth drawn afterward, yet declare that they felt no pain. The blood need cause no trouble if the patient's head be turned to one side and a sponge put down between the teeth and cheek to take up the blood as it flows to the lowest part of the mouth.

No one should administer an anæsthetic until he is fully acquainted with the dangers which he may encounter and be prepared to meet them. Death may take place when anæsthesia is complete by the tongue falling back in the throat, thus preventing the entrance of air into the lungs; in this case the tongue should be quickly and forcibly drawn well forward. Again, the muscles of respiration may be convulsed or relaxed. The heart continues to beat but the breathing has ceased. First be sure that the air passages are clear, then begin artificial respiration.

I know no greater danger in ether anæsthesia than that of vomiting large pieces of undigested food, which instead of being ejected may fall back and close the trachea, thus preventing the entrance of air. When the patient attempts to vomit he should be turned to one side and the vomited matter rapidly cleared from the throat; if there should be difficulty of breathing, the lower jaw should be thrust forcibly forward by placing the thumbs behind the angles and pressing forward, this serves to carry the tongue away from the posterior wall of the pharynx.

No person should pin his faith to a single anæsthetic, but be able to judge which will be the better in the case in question. If there is severe cough, bronchitis or any pulmonary obstruction ether should not be used. In advanced arterial disease or for very young children, chloroform should have the preference. Chloroform has generally been stated to be the better anæsthetic for operations about the head and face, but ether is used almost exclusively for such operations in the University Surgical Clinic and with good effect. The operator has much confidence in its safety and is not constantly interrupted to see if his patient is breathing. I have used ether as an anæsthetic a number of times in tooth extraction, and must say that as a rule I much prefer it to chloroform for this purpose: 1st. Because of its safety. 2d. Because anæsthesia lasts much longer when the cone is removed.

The objections raised against ether, viz., the irritation to respiratory organs, the cost, as compared with chloroform, the after-effects, as nausea and vomiting, can scarcely be thought of when we come to consider the safety. Why should we peril human life for the sake of overcoming a few minor inconveniences? If all who are here to-night will give ether a fair trial in dental practice, I have no fear of the result.

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## Nitrous Oxide.

BY J. LATHROP, JR., D.D.S.

Read before the Thirty-eighth Annual Meeting of the Michigan Dental Association.

Nitrous oxide, or nitrogen monoxide, or better known as laughing gas, is a colorless, odorless gas at ordinary temperature; but is a clear liquid under pressure of fifty atmospheres at forty-five degrees F.

It was first discovered by Priestly in 1776, but its exhilarating and analgesic effects were not noticed until 1800, when Dr. Davy made them known. As an anæsthetic it was not used until 1845 when Dr. Horace Wells, a dentist, demonstrated its power of destroying physical pain, and from that time until the present it has been extensively used by our profession. It is without an equal in minor operations about the mouth, although it has been used in major ones; and patients have been kept under its influence an hour and forty minutes.

The gas can be obtained by reducing nitric acid and is oftentimes formed when copper is treated with the concentrated acid, but when it is made in this way we find so many impurities in it that it is hardly practicable. The usual method of making it, is by heating in a retort pure ammonium nitrate until it decomposes and the gas is liberated, but the heat should not exceed 400 F. for above that, bad gas is formed. The ammonium nitrate melts at 320 F. and the gas is given off, and very rapidly at 470 F. The ammonium nitrate breaks down into nitrous oxide and water.

We find many impurities passing over with the gas unless the ammonium nitrate is perfectly pure, chlorine being the principal one, and before the gas is let into the gasometer it should be passed through three receivers, the first of which contains water to cool the gas, the second potassium hydrate to neutralize any chlorine, nitric or nitrous acid or carbonic acid gas that may be present. The third contains ferrous sulphate to collect from the vapor any nitric oxide and reduce it to nitrous oxide.

We find that cool water will absorb about 80 per cent. of the gas but on warming it will give it up. The gas has a specific gravity of 1.527 and will support combustion almost as well as pure oxygen.

The gas thus obtained is one of our general anæsthetics, when inhaled in sufficient quantity will produce profound anæsthesia. It does this probably acting indirectly, by interfering with the circulation in the brain, and arresting the process of oxidation and tissue change in the nerve-cells, which is absolutely necessary for functional activity. The time for its anæsthetic effect to be produced varies, and no set time can be given. We have three distinct stages during anæsthesia of nitrous oxide: the excitant, narcotic and anæsthetic. We find it first affecting the heart and cerebrum by stimulation, producing the excitement or first stage. In the second stage, the cerebrum and reflexes are partially narcotized and the patient becomes quiet and indifferent, with pulse reduced to almost normal, breathing regular and deep, face somewhat flushed. The patient loses consciousness or inability to talk or think, but the reflexes and motor influences are active. In the third, or anæsthetic stage, the cerebrum and reflexes are abolished and the motor impulses impaired. The pulse is full and regular, breathing is periodic and interrupted ; more or less cyanosis appears in the face and other delicate and vascular parts of the integument, and there is no response to the irritation of the conjunctiva, which is one of the last reflexes affected. The gas is not decomposed in the body, but it is exhaled in the same form as inhaled. In the body it is found in the blood and takes the place of the oxygen. Nitrous oxide can not be decomposed in the system, since the temperature of the body is not high enough to destroy its molecular affinity, and there are no chemical affinities met with in the system sufficiently powerful to change it. Experiments also show that the exchange of gases practically stops after it has been administered for a few minutes, and the gas is exhaled in the same form and quantity as inhaled.

The blood of a dog was analyzed after the administration of the gas for one minute and forty-five seconds and was found to contain :

| | | | |
|---|---|---|---|
| $CO_2$ gas | 37. | 3 minutes ($CO_2$ | 36.6 |
| O | 5.2 | ( O | 3.3 |
| $N_2O$ | 28.6 | ($N_2O$ | 34.6 |
| N | .7 | | |
| 4 minutes ($CO_2$ | 34. | | |
| ( O | 5.05 | | |
| ($N_2O$ | 37. | | |

Like ether, it kills by paralyzing the center of respiration and not by asphyxia, for we do not have an over-amount of carbonic acid gas. The heart center is not paralyzed so quickly because of its characteristic stimulation even to the last.

From its first use until the present time there are only eleven deaths reported from the administration of nitrous oxide, and only five of these can be with any certainty traced to the direct action of the gas. In four only of these was a post mortem held, and three were caused by paralysis of the heart and lungs, while in the fourth the verdict was asphyxia.

It is the safest of all our anæsthetics, and in comparison with chloroform we find one death to every 2,500; and ether one death to every 23,000. It can be given to people of all ages and conditions with comparative safety except in fatty degeneration or valvular trouble of the heart, aneurism or atheromatous blood vessels, and to women after the seventh month of pregnancy.

We may have after or secondary effects from the use of nitrous oxide which do not demonstrate themselves for days after the operation, and it is probable many fatal cases will be traced to the after-effects of nitrous oxide, as there is already some evidence to confirm this prediction.

Dr. La Fount warns against the production of diabetes. He reports a case where sugar appeared in the urine and also in his own after the administration of the gas. Dr. Kendelheim died from diabetes which he persistently attributed to nitrous oxide.

While the after dangers of the gas are probably not great the high blood pressure with venous stasis, which are undoubtedly present during anæsthesia, strongly indicate that when atheroma or other diseases of the arterial walls exist nitrous oxide is less safe an anæsthetic than ether.

## ADMINISTRATION.

There are two forms of apparatus used for storing and administering the gas: one by the gas bag, the other the gasometer. The gasometer is almost universally used, it being the handiest can be used to a better advantage, for the gas can be better controlled than with the gas bag. It is also more economical and less liable to contamination. The only advantage the gas bag has over the gasometer is that it is portable.

In the administration of the gas to a patient, the mouth-piece and hood are used. Some practitioners use the mouth-piece, but the hood although it has some advantages is, without doubt, preferable. The operator has better control of the patient than when using the mouth-piece, unless he has a skilled assistant who will take charge of the administration. Many patients object to the mouth-piece because it seems unclean, from the fact that it has been in the mouths of many other people. The other features of the modern gas apparatus are so familiar as to need no further comment here. In brief, a good gas apparatus should be easily and quickly operated, easily kept in repair, of ample capacity and more or less ornamental, comely and tasteful, rather than formidable.

If the liquid gas is used the gasometer should always be kept nearly full, so that the gas may be of suitable temperature to administer at any time. When the gas is freshly released from the liquid state it is cold and not of suitable temperature to apply to sensitive mucous membranes.

Sufficient gas should be given to produce complete anæsthesia, for there is danger from shock and after-effects when complete ansæthesia is not produced. In complete anæsthesia the reflexes are paralyzed, and irritation of the sensory nerves by extraction of a tooth has no effect either upon the vagus or upon the vaso-motor; while in imperfect anæsthesia the reflex centers of the heart and circulatory system may be paralyzed because of the presence of the gas in the blood, and the vagus centers not affected; hence, the shock caused by the extraction of a tooth may, through a reflex action on the vagus or inhibitory center, cause the stoppage of the heart, there being nothing to counteract the tendency to faint, syncope may prove fatal. There is, however, less danger from the use of gas than with chloroform or ether, as the nitrous oxide causes a venous condition of the blood with consequent vaso-motor stimulation and contraction of the arterioles and a rise in blood pressure so that a tendency to syncope through vagus irritation is counteracted.

Strangulation is another thing that should be guarded against, for during the administration of the gas the tongue may fall back into the pharynx and the muscles of the pallet contracting thus causing a stoppage of the air passages.

During the administration the respiration should be regular, full and free; difficult, or irregular and spasmodic breathing are dangerous symptoms, so also is prolonged or indifferent breathing.

The pulse will be quick and nervous at first, but as the anæsthetic takes effect it becomes full, strong and frequent, finally becomes regular, full and a trifle more frequent than normal.

In giving the anæsthetic a third person should always be present, for we have a case on record where the operator was accused and convicted of a crime of which he was probably innocent.

Nitrous oxide is sometimes combined with ether or chloroform, or both, which prolongs anæsthesia, and when combined in this manner it is known as vitalized air.

On account of the brevity of the effect of nitrous oxide, more extensive operations are undertaken than are justifiable, resulting in severe nervous shock to the patient or bungling operations, causing more or less wasteful destruction of the oral tissues. It would be far better to repeat the administration, and attempt only so much work as may be properly done under each administration. There is usually no objection to a second and even a third administration at one sitting.

It is important that all valued convenient instruments and restoratives should be readily available. Proper and sufficient instruments for any possible emergency in difficult extractions are essential, even so are adequate restorative measures.

## DISCUSSION—CHLOROFORM, ETHER AND NITROUS OXIDE.

Dr. A. M. Long: I will say the paper just read is one of the best on nitrous oxide that I have seen. It is not an easy task to write on this subject; there is such a diversity of opinion and the experiments that have been made vary nearly as much as the different claimants vary as to its discovery. While there is a controversy as to the effects and methods and means of administering nitrous oxide, there shall be none between the author and myself in calling nitrous oxide gas an anæsthetic. There have been many circulars sent to dentists denouncing the anæsthetic effects and claiming that it is only "asphyxia." The author has pointed out the action of nitrous oxide on the nervous system and what nerves are mostly affected; also upon the heart and vascular system. He has also given the three different stages; excitement, narcotic and anæsthetic. In the excitement stage success depends largely on the operator and the surroundings. He must be composed and have perfect confidence in himself. Of course, we will take it for granted that he has a good gas apparatus and an inhaler, and that they are in perfect working order, and no air allowed to leak through the tube or inhaler, if air be allowed to mix with gas it will produce fear and often screaming. The effects and excitement of alcohol are quite different from that of air, it breaks out in a combative or pugilistic form. If I know that my patient has been drinking I refuse to administer gas until he is free from liquor. It takes but a step aside to increase or modify the action of gas. The inhaler valves must be large to admit the exhaling and inhaling, and they should be free from springs. The receiver should force the gas to the patient and it should be as easy to inhale as pure air. Inhalers with small inhaling and exhaling valves, and the patient compelled to draw the gas to him with lung force, will produce an unpleasant effect in the excitement stage, and, in fact, will, all through the administration, and a failure will be the result. The small valved inhalers that we find in our markets are more to blame for the suffocating effects, and the deep and irregular breathing, also the blueness which appears in the face and lips, than the gas.

We will admit, from the effects of the gas on the system, that there is some cyanosis visible, but I here repeat, that it is not so well defined where a perfect gas apparatus is in use.

On page 2, I see the author accepts the theory of the gas replacing the oxygen. I find but two principal theories in regard to the physiological action of nitrous oxide. One theory is that the anæsthetic effects are due to the greater volume of oxygen in the lungs than they are accustomed to receive. The nitrous oxide contains more oxygen in action, which produces a stimulating effect.

The other theory is, of insufficient oxidation; claiming that the gas acts principally by occupying the space in the lungs normally held by the oxygen of the air, and to its exclusion, preventing the proper oxidation of the blood followed by suspended sensation.

On page 6, the author refers to the combining of chloroform and ether with gas. I have, for over ten years, used equal parts of pure alcohol and chloroform—about two drops of the mixture to one gallon of gas.

I know there is a strong prejudice with many against the mixture, but I know where the combination has been tried it has grown in favor. It has been argued that each anæsthetic agent possesses properties peculiar to itself. We claim for it, that the powerful agents are so small in combination with the quantity of gas that the gas is not impaired by it, and that the chloroform does not get further than the first stage of stimulation before the gas has produced full anæsthesia. I prefer chloroform to ether, as it conforms more easily to nitrous oxide, and is less irritating.

G. E. Corbin, St. Johns: In relation to the profession of medicine and surgery and the profession of dentistry a question of more importance than the one now before us could hardly be raised. Just think for a moment what surgery was before the days of chloroform and ether. Think of calling in the neighbors when some one had been so unfortunate as to need a limb amputated—calling in several of the strongest men to lash the unfortunate person to the table, while amid the shrieks and groans of the sufferer the limb was amputated. Then think of the possibilities of the present day—of accomplishing all that while the patient is quietly sleeping, and perhaps enjoying pleasant dreams. But while this possibility of performing operations without pain has worked great benefit in some departments of the profession, it is also true that in others it has worked great injury, and I am sorry to say this latter fact is especially true of our own branch of the profession. In serious surgical operations we can well afford to take the risk of the legitimate effects of an anæsthetic; in trifling operations I think we cannot afford to take such risk. Hundreds and thousands of teeth that might have done good service, teeth that were perhaps better than those with which they were replaced, have been extracted simply because it could be done without pain.

During my early student days, at the University of Michigan from 1852 to 1855, I saw chloroform used freely by Dr. Gunn, Professor of Surgery at that time; I do not know that very much was known about ether then, at any rate chloroform was the anæsthetic generally used. At Blakely College during the winter of 1868 I saw many operations performed by the distinguished Dr. Gross, and the anæsthetic used was almost always chloroform. It was administered by saturating a towel with chloroform and then pressing the towel tightly over the mouth and nostrils of the patient. Sometimes the patient would exhibit alarming symptoms; he would be rolled over and restoratives applied; the towel would then be placed over his mouth as before. Often it would be necessary to partially revive the patient two or three times before it was considered safe to completely anæsthetize him, but I saw no serious results arising from the use of this anæsthetic. The percentage of deaths as given in the first paper read this evening is certainly very serious and we regret it very much. Yet, beyond all question, in many of those cases had the operation been performed without an anæsthetic there would have been many more deaths caused by the shock of the operation. I am of the opinion that if chloroform be administered carefully, that is, diluted sufficiently and given slowly so as not to give any more than is needed to produce insensibility, there is as little danger as from the use of ether. If the statement in the first paper, that the anæsthetic effects of ether last longer than those of chloroform be true, it would seem to me that chloroform is the less dangerous, because the vital organs are not acted upon for so long a time. The danger is that one is very apt to give too much chloroform. Of course the effect of this anæsthetic upon the kidneys and other organs will alter the truth of my general remarks, but so far as its local effect, upon the respiratory organs is concerned, I think chloroform is much less harsh than ether.

Another point: Many times death is caused by strangulation. I remember Dr. Gunn used to refuse to administer an anæsthetic in cases where the operation would fill the mouth with blood. He considered there was more danger from strangulation than from the legitimate effects of the anæsthetic. Even in quite serious operations about the mouth he utterly refused to administer anæsthetics.

DR. E. T. LOEFFLER, Saginaw: For the first year or two of my practice I used chloroform; it worked quickly and seemed perfectly satisfactory. But as I looked into the matter I changed my mind and I now am greatly in favor of using ether, especially when patients cannot be put in a horizontal position; I think dentists are always justified in using ether on account of the position of the patient.

We, as professional men, have a great responsibility in administering anæsthetics. Patients come into our offices in a specially sensitive condition. The parts to be operated upon are in an irritated condition and the whole nervous system is sympathetically affected, and that is a cause of great danger. We ought, on that account, to be very careful in administering an anæsthetic. Freedom of respiration should always be looked after. Too often patients are hurried into the chair without due precaution being taken. This point of precaution cannot be too strongly urged.

W. P. MORGAN, Saginaw: I do not know that I can add anything to what has already been said. The ground seems to have been very thoroughly discussed. So far as the results of anæsthetics are concerned, I would rather take the chances of the effect of an anæsthetic than that of shock without it. One important point is to gain the confidence of your patient. If the patient thinks the operator is afraid, he, too, will be afraid, and this element of fear will make the danger much greater. Allow no one in the room to talk and disturb the patient. Before the anæsthetic is administered the patient should be shown how to breathe. Strangulation is usually caused because the breathing is not done in the right way. If short breaths are taken, after one or two it is necessary to take a long breath, and that is what causes strangulation; but if the breathing is done naturally, there need be no trouble. Just before administering the anæsthetic speak a few quieting words to keep the patient's attention away from what is about to be done. I consider it necessary to give the anæsthetic in a warm room, and the windows should not be opened lest the patient be in a draught. The sitting posture is safer, as there is less danger from strangulation.

DR. LONG: We all, I think, believe the introduction of anæsthetics to have been one of the most brilliant events in our history, and we all believe in their use. While nitrous oxide is considered one of the minor anæsthetics it is not one of the least; I think it one of the greatest and one of the safest to use.

DR. D. WOOLSEY, Battle Creek: I would like to ask Dr. Corbin what effect chloroform would have upon children from six to ten years of age?

DR. CORBIN: I have administered chloroform to children of all ages and for other purposes than the extraction of teeth—for operations upon the ears and nose. It is only necessary to bear in mind what effect is desired and then to administer the anæsthetic so slowly that such effect can be attained. I cannot conceive why chloroform is not just as safe as any other anæsthetic that produces complete anæsthesia. I cannot but feel that there is some danger in every case of insensibility produced artificially. The danger is in saturating the system. Chloroform is so much more powerful than ether that, as I stated before, one is liable to give too much.

DR. WOOLSEY: Children we cannot reason with, and when they are suffering we can do nothing with them, and my question was, whether or not the dentist would be justified in giving a child just a few whiffs of chloroform and in this way get over the difficulty?

DR. CORBIN: I think just enough chloroform to quiet the child, to produce unconsciousness, would be justifiable. Of course, the less of the anæsthetic given the better.

DR. W. H. JACKSON, Ann Arbor: I would like to ask if nitrous oxide is a chemical compound? Does it give up its constituent parts or does it go into the blood unchanged?

Dr. LATHROP: There is a difference of opinion as to that.

We used to think that part of the nitrous oxide was assimilated by the system. We, too, used to think that lime when taken went directly to the teeth. I believe that theory has changed and authorities now state that we do not get a direct effect from the lime, but that it must be taken through the stomach in a vegetable form. I think it is more generally believed now that the blood does not take up the gas; it is simply exhaled as pure air.

Dr. Jackson: In nine cases out of ten, where death occurs after the administration of anæsthetics, it arises from accident rather than from the effects of the anæsthetics. The attention of the assistant is often too much centered upon the operator, when it should be centered upon the patient. Many times in my own practice have I been obliged to stop and run my forceps into the throat and pull out the tongue to prevent a fatal accident, the cause of which would, in all probability, have been attributed to the anæsthetic. Then, too, we are apt not to pay enough attention to the clothing; it should be loose enough not to impair, in any way, the breathing. A careful examination of the condition of the patient should always be made, because a little overstraining of the nerves at the time of administering the anæsthetic may cause fatal results. There are three sets of nerves acted upon—the nerves of sensation, the nerves of voluntary motion and the nerves of involuntary motion. In the susceptibility of those nerves to the anæsthetic lies the danger. If the condition is such that the nerves of involuntary motion are acted upon first, where is your patient? Where are you? And there is a possibility of such a condition being met with. It is well to have a third person present when an anæsthetic is administered. Should time of danger come it needs a cool mind—a moment's hesitation may be fatal.

Dr. W. W. Williams, Sault Ste. Marie: I had, perhaps, a somewhat unusual experience with one case. I kept a patient alive for three weeks longer than he would otherwise have lived by the administration of nitrous oxide. The patient had a serious disease; he had considerable trouble with his heart and was expected to drop away at any moment. In the meantime he suffered with toothache. He came to me to have them extracted.

I administered gas and extracted two teeth. He went away from the office feeling better than he had for some time before; a condition which he attributed to the effects of the nitrous oxide. After that, whenever he felt worse than usual, he would come to me to have a little gas administered. He did this, at intervals, for three weeks; he then went away into the country; while there, after eating a hearty dinner, he was taken very sick and died before he could reach home. His friends thought if he only could have had some gas administered then he would not have died.

Dr. J. Lathrop, sr., Detroit: I am a believer in nitrous oxide. Of the two modes of administering it each has its advantages. That employing the mouth-piece keeps the mouth open when the patient is under the influence of the anæsthetic, though I, personally, have experienced little trouble in getting into the mouth of the patient after he has been anæsthetized. With the hood I have had a little trouble. Some dentists complain of patients, during the first stages of anæsthesia, becoming excited. I have found it well, when there are signs of distress and nervousness, to admit a little air. Many times I have overome this difficulty by requesting the patient to breathe rapidly, say fifteen inhalations, before putting the hood to the mouth; the patient will pass under the influence of the anæsthetic much quicker and less gas will be needed.

As to the use of cocaine and other modern appliances for producing anæsthesia, I think in nearly all cases nitrous oxide might be applied more advantageously. I have sometimes given what the patient supposed was nitrous oxide and extracted teeth without pain, so the patient claimed, when, in fact, nothing but ordinary air had been inhaled. This method certainly has its advantages; what its scientific effect is I am unable to tell; the results are admirable.

Dr. H. P. Ball: I administered nitrous oxide to a patient. Three days afterward she was taken sick and has been sick ever since. Her family physician claims the gas was the cause of her illness. I would like to ask if this could have been the case.

Dr. Jackson: That depends on the nature of the sickness.

It might have resulted from the operation. The blood clot may have broken down and blood poisoning have been the cause. If this was the cause you should have been called upon to treat it. Every young dentist should study enough of medicine to treat such cases as are liable to come under their hands. If the patient does not call upon you in such cases, you cannot be held responsible for the results. Dentistry is only a branch of medicine. You expect an aurist to treat not only your ears, but your general system; a dentist should treat his patients constitutionally as well as locally.

DR. BALL: I do not think the clot was broken down in this case; so far as I could determine the symptoms seemed to be such as would be caused by the gas. Some of the doctors say the patient was coming down with some systemic disease which came out at that time. But her family physician says it was caused by the gas.

DR. F. W. TEMPLE, Grand Rapids: A lady went to a dentist to have a tooth extracted. She was advised to take gas and assured that no harm would result. She took it; there was considerable trouble in restoring her to a normal condition, but she finally came to and went home. Just as she was about to ascend the steps at her home she fainted. She was sick for four or five weeks. A corps of doctors attended her; she was delirious for two weeks; but finally she recovered. What was the cause is not known. It is a question whether her illness resulted from the effects of the gas or from some systemic trouble.

DR. CLELAND, Detroit: I have had a few serious experiences with nitrous oxide. The gas had been kept where some drugs were stored and it had taken them up. A new retort was strongly impregnated with it.

In one case where the gas had probably taken up the odor of the drug, I did not notice this in the gas itself, but detected it in the patient's breath. She coughed so hard I was unable to use it; the cough was similar to that induced by sulphuric acid.

A GENTLEMAN: I, too, have had an experience similar to that related by Dr. Cleland. At one time the gas had a peculiar odor, like that of chloride of lime. It caused coughing and irritation. Of course we did not use it.

With regard to patients being taken sick after the administration of gas, I think many such cases could be traced to some other cause than the anæsthetic. Many would have been sick had they not taken an anæsthetic. I have had patients who were sick after having teeth extracted, although no anæsthetic was administered.

PROF. J. O. REED, Ann Arbor: I would like to ask whether it is customary in dental practice to prescribe an antiseptic mouth-wash after operations about the mouth. If that were done it would not seem that bad results would so often follow. After the extraction of teeth the patient often has a high temperature and is obliged to go to bed. Could that not be avoided if an antiseptic wash were used ?

DR. JACKSON: After administering an anæsthetic, especially chloroform, we are more apt to have a breaking down of the blood clot and consequent suppuration, than without an anæsthetic. But in either case I always use as a mouth-wash after extracting teeth a solution of boracic acid; should the blood clot then break down I use the following: 2 pints metallic iodide, ½ drachm carbolic acid, 3 ounces glycerine. I prepare this at my office. Apply in full strength in every socket. It will not blister.

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## Cocaine.

BY ARTHUR R. CUSHNY, A.M.,M.D.

Read before the 38th Annual Meeting of the Michigan State Dental Association.

Cocaine was first introduced into medical practice in 1884 although its action had been described some 18 years before. Between 1884 and 1889 about 114 cases of poisoning occurred of which 6 proved fatal. The publication of these figures has resulted in deterring many surgeons and others from the use of a most useful drug. On examination, however, we find that in many of these cases what must be characterized as enormous doses were used, for in two cases which I have looked up the doses used were 12 and 20 grains respectively. Cocaine belongs to the group of the alkaloids, and these, as you know, comprise some of the most powerful poisons. Very few of them could be injected in doses of 5 grains, and cocaine is no exception to the rule. To discard all drugs that are poisonous in doses of 12–20 grains would result in removing from the pharmacopia almost all the most useful active principles.

Cocaine acts principally on the peripheral endings of the sensory nerves and on the central nervous system. The terminations of the sensory nerves are completely paralyzed, causing anæsthesia of the part to which cocaine has been applied. This paralysis is however not confined to the peripheral endings, for recent investigation has shown that sensory nerve trunks may also be paralyzed by cocaine, that is, the conducting power of nerves is destroyed. Whether it would be advisable to use this paralysis of the nerve trunk for anæsthesia is, I think, open to question, for such interference with the trunk of a nerve is liable to set up neuritis.

The peripheral action of cocaine is that which is made use of chiefly in practice. Its action on the central nervous system is only seen in cases of poisoning, and in rare cases where it is used internally as a stimulant. Schroff described this central action many years ago, and it has been in use in South America since time immemorial for its action on the brain. Anrep studied its action on the dog and described it as a powerful stimulant to the brain. The dog immediately after the injection becomes excited, and cannot stand still but runs about, leaping and dancing on his hind legs without cessation. The movements are altogether different from those seen in strychnine tetanus. There is no convulsive movement, no tonic contraction. The action seems to be on the highest spheres of the brain. The movements are those of a pet dog meeting his long-lost master. This stage lasts one to three hours and then gradually passes off, the animal becoming normal again.

On larger doses being given the stage of excitement is still greater, but then one sees distinctly that the dog has no longer control over himself—he runs in a circle, and when called evidently tries to approach, but cannot leave off the constant movement. in fact, his motor centers have run away with the animal. If caught he is found to be restless, scarcely recognizes his owner; is very easily frightened and trembles violently. After some time this stage passes off, and languor and exhaustion set in, but he recovers in a few hours completely. On giving 1-3 grain per kilo a short stage of excitement is seen but very soon great exhaustion follows, then convulsions, unconsciousness, stupor. The explanation of these symptoms is extreme stimulation of the cortex. This stimulation is followed by weakness and paralysis of the centers. In man this stimulation is also seen often in smaller doses—talkativeness, disposition to movement, laughter, general jollity. More marked, however, in man is the stage of paralysis of the brain shown by giddiness, langour, feeling of weakness and faintness, pallor, indistinct vision, unconsciousness which may go into collapse. The pupils are widened by stimulation of the sympathetic terminations in the iris. The respiratory center is first stimulated. A curious feature is a sort of Cheyne-Stokes respiration which appears in severe poisoning. Even with small quantities it is found that the breath can be held much longer than normally. The respiratory standstill is the cause of death. The heart itself is comparatively unaffected, but the vagus is paralyzed and it is therefore quickened. In very large doses it may be weakened and slowed by direct action of the drug on the heart muscle. All the mucous and salivary secretory glands are weakened, and patient complains often of dryness of the throat and tongue.

In conclusion, I think I am justified in saying that the disrepute into which cocaine has fallen in a section of the profession is undeserved. The smallest dose which has hitherto been shown to produce any dangerous symptoms is 1 1-4 grains, and this is more than is sufficient for any of the smaller operations and is far more than is required for, at any rate, one tooth. The only point to be remembered, is that the cocaine must be pure, and that it ought to be used in about four to five per cent. solution. When impure cocaine is used, the blame should be borne by the manufacturer and operator, and should not be laid on the drug.

I should like to say a few words regarding the chemical nature of cocaine, as it is probable that before many years are over several new allied preparations will be put on the market. Cocaine like so many of the vegetable alkaloids is a derivative of pyridine. In it the pyridine ring is combined with oxypropionic acid to form ecgonine. The ecgonine is then combined with methyl and the hydroxyl group substituted by benzoyl. In coca we find several other alkaloids closely resembling cocaine in their composition and action, such as cinnamyl cocaine in which the hydroxyl group is substituted by cinnamyl instead of benzoyl and the truxillines in which the molecule is doubled. Besides these, several cocaines have been formed artificially and we seem to be approaching the time when we will no longer depend on the coca leaf for our supply of cocaines because they will be manufactured synthetically. Moreover, the molecule of cocaine can be altered so greatly and still preserve its anæsthetic properties, that I think we may very soon form a base which possesses all the virtues and none of the disadvantages of cocaine.

Ecgonine is very nearly related to the tropin radicle found in atropine, hyoscine, etc., and a new alkaloid has been described lately which belongs to the tropeins or rather the pseudotropeins, but possesses the cocaine anæsthetic action. This new alkaloid is Tropacocaine. As you are aware atropin and the allied bodies have been long known to possess slight local anæsthetic powers. This power is much increased however in tropacocaine, which, as a local anæsthetic, promises to prove a formidable rival to cocaine. Its pharmacological action has been studied by Chadbourne, who attributes to it a considerably greater anæsthetic action than cocaine with less pronounced toxic properties. Its anæsthetic properties have been testified to by several ophthalmic surgeons, but its use has been too limited as yet to admit of my discussing whether its toxic action is greater or less than that of cocaine. Here again, however, we have another series of bodies possible which may prove to be of great service as local anæsthetics, and, if the pseudotropeins prove to be less dangerous than the cocaines, we may possibly find in a few years cocaine dropping out of use and its place being taken by a synthetically manufactured pseudotropein.

# Local Obtundents.

BY A. W. HAIDLE, D.D.S.

Read before the 38th Annual Meeting of the Michigan Dental Association.

Local obtundents, or to use a more general term, local anæsthetics, are employed to temporarily abolish the sensibility of a part, and allow slight incisions or operations to be made painlessly.

Their effect is in some degree due to a paralysis of the end plates of the terminal branches of the cutaneous nerves, and possibly to some extent to a sedative action upon the blood vessels and tissues, analagous to that which is produced by rubbing or scratching, which gives temporary relief in itching. Local obtundents may be divided into two general groups:

1st. Agents which are applied or administered as drugs, either singly, or in combination with others.

2nd. Agents which are applied to produce thermal changes.

In the first division we find the following: aconite, atropine, campho-phenique, carbolic acid, chloral, chloroform, cocaine, menthol, morphine, opium, pyrethrum and veratrine.

As thermal agents we may employ: ice, ether spray, rhigoline, chloride of ethyl and chloride of methyl.

The greater number of the remedies mentioned in the first group are rarely used alone, being more frequently employed in combination with other drugs, and we find in our dental literature and text-books, and in the discussions of dental societies, numerous formulæ given, some of which are good, others inefficient, and, still, others which should be used with great caution. In order to construct a formula which shall prove efficient in obtunding the sensibility of the oral tissues, it will first be well to examine into the histology and physiology of these tissues, and into their relations with the general nervous and vascular systems. We find that the mucous membrane covering the alveolar process consists of an epithelial covering, lying upon a connective tissue stroma, the tunica propria. The epithelium is of the stratified squamous variety, and is continuous with the epidermis on the one hand and with the covering of the pharynx on the other. It occupies a place as regards power of absorption, midway between the two, having greater power of absorption than the epidermis, and less power than the mucous membrane of any part of the alimentary canal below the mouth. The tunica propria is composed of interlacing bundles of fibrous connective tissue, and possesses numerous simple papillæ, which encroach on the epithelial layer, but do not appear on the free surface of the mucous membrane.

The larger blood vessels lie within the sub-mucous tissue, and give off branches which extend through the deeper layers of the mucosa to the superficial portions of the connective tissue stratum ; on reaching the outer boundary of the latter the arteries break up into rich sub-epithelial capillary networks, and where papillæ are present, enter the minute elevations to supply their apices with terminal capillary loops. The nerve-fibers, largely of the medullated variety, accompany the blood-vessels, and end in a sub-epithelial plexus; and special terminations—the end bulbs—are found in the apices of some of the papillæ.

It will readily be seen that for the drug to accomplish its purpose of destroying sensibility, it must pass through the several layers of cells which make up the epithelium, and which range from the irregularly-shaped columnar and polyhedral cells, to the large, flat and scaly type so characteristic of the outer layers of stratified squamous epithelium, and must therefore possess in a marked degree either the power of penetration or the property of being easily absorbed.

By comparison with the mucous membrane lining the lower portions of the alimentary canal, it is found that while the mucous membrane of the stomach and of the intestines is especially adapted to the function of absorption as well as of secretion, that of the mouth is distinctively a secreting and not an absorbing tissue.

When, therefore, the power of penetration or the property of being easily absorbed are not inherent in the drug which is to form the *basis* of the formula, it becomes necessary to add a drug which will *aid absorption.*

Absorption can be aided in two ways: first, by increasing the circulation at the point of application, which can be accomplished by gently rubbing the part, or by the application of irritant substances; and second, by the use of an agent possessing endosmotic power. Such agents we have in chloroform and ether. Water, oils and resins do not have this property.

It is thought by some that alcohol possesses powers of endosmosis, but Waller has proved by experiments on the skin that this is not true. While it is as great a solvent of the sebaceous matter found in the skin as chloroform, it is not absorbed as quickly as this agent. Experiments on this point were made with iodide of potassium, which is a drug very readily detected in the urine. Waller, therefore, concludes that absorption is aided more by the endosmotic than by the solvent power of a drug.

If the basis of a formula is not sufficiently powerful in its action, an *adjuvant* should be added—a drug which will intensify or enhance the action of the basis. Such a drug we again find in the volatile liquids mentioned above, which are also aids to absorption. Heated applications act more energetically by increasing the circulation in the part.

It may be necessary to add a *corrective* to the formula. The basis may be too irritant or caustic and its harmful effects must be corrected. These effects may be either local or general, and the corrective used depends entirely upon the nature and action of the drug to be corrected. Only a few years ago chloral was extensively used as a local anæsthetic, and its irritant and caustic effects were demonstrated by the many cases of inflammation and sloughing of the part which resulted.

The local and the general effects of chloral are antagonized by carbolic acid, by atropine and by several others of the alkaloids. The nature of the action of these antagonistic drugs seems to be somewhat obscure. In commenting upon it, Brunton says: "Some regard the effect of one drug in counteracting another as a case of chemical combination or substitution, the second drug either becoming added on to a compound of the first with some of the tissues; or else displacing it from such a compound with the tissues. Others, again, think that no chemical action of this sort takes place, but that each drug acts upon the tissue by itself, —one, for example, exciting, and the other paralyzing."

Again, it may be necessary to add to the formula a *limiting agent*, a drug which will limit the endosmotic power of the basis. This may be accomplished in two ways: first, by the action of coagulants on the albumen of the protoplasm of the tissue cells; and second, by coagulative action on the blood capillaries and on the albumen of the serum contained in the tissues. Coagulation of the albumen of cell protoplasm may be produced by the use of such agents as carbolic acid, tannic acid, lead acetate, mercuric chloride, silver nitrate, copper sulphate, zinc chloride, etc., all of which combine with the albumen to form albuminates. Coagulation of the albumen of the serum in the tissues, and of the blood capillaries, may be produced by the use of astringents, including among those already mentioned as coagulants, others of the mineral and vegetable acids, alcohol, alum, and still other salts of the heavier metals.

In nearly all cases it will be necessary to employ a *diluent*, and the agent employed for this purpose should also be a *solvent*. The nature of the diluent must depend largely upon the nature of the basis, the diluents commonly used being chloroform, ether, alcohol, distilled water and glycerine.

Finally, it must be observed that the mixture is *antiseptic*, and that the agents employed are *compatible* with each other, to such a degree at least as not to prevent the accomplishment of the desired result. The mixture should be reasonably *stable*.

It will not be necessary to add to the formula a drug for each effect, for an agent may be employed to accomplish several results. As an example of such an agent chloroform may be mentioned; this may be employed as an adjuvant, an aid to absorption, a diluent, and it is also a solvent of almost unlimited power and scope. A good formula is given in Gorgas' *Dental Medicine*, which is as follows:

R. Tinctura aconiti..........................j fl. ounce.
Menthol..................................x grains.
Chloroformi...... ...................j fl. drachm.

M. S. Apply freely to gum about tooth for several minutes.

Aconite forms the basis and is a powerful nerve sedative. Its action when applied locally is to irritate the sensory nerve endings, causing a peculiar numbness and tingling, and afterward paralysis. Menthol is employed as an adjuvant, has marked anæsthetic action and is also antiseptic. The chloroform is the diluent and is an aid to absorption as well.

Another, and an excellent formula from the same source is as follows :

R. Chloroformi purificati.... ......
Tincturæ aconiti....................
Alcoholis, aa.......................j fl. ounce.
Morphinæ sulphat ..................vj grains.

M. S. Apply for one or two minutes to gum over root of tooth to be extracted.

A formula constructed by Dr. von Bonhorst contains :

R. Chloroformi........................
Aetheris sulph............. ........
Spiriti lavandulæ..................
Pyrethri (fl. ext.), aa............ j fl. ounce.

M. S. Apply for one or two minutes to gum over root of tooth to be extracted.

Among the drugs employed without combination with other drugs cocaine is the most important. An alkaloid occurring in colorless, transparent prisms, its salts are readily soluble in chloroform, ether, alcohol and water, and are rapidly absorbed.

The dose is gr. ss to gr. j. For epidermic application a solution in chloroform may be used varying in strength from a 6 per cent. to 20 per cent. solution. Dr. Hewitt, of Chicago, recommends the following formula for all operations about the gums:

R. Cocaine ...............................cxx grains.
Atropine ... ........................$\frac{1}{10}$ grain.
Strophanthin.........................$\frac{1}{5}$ grain.
Naphthol hydrate .................x grains.
Oil of cloves................ ......
Oil of cassia.......................
Chloroform, aa.....................ij drachms.
Glycerine...........................j drachm.

The basis of this formula is cocaine, which used in this amount and proportion makes a 22 per cent. solution, very strong for epidermic application. It should be used with caution, and never be injected into the gums. This formula is deficient in correctives. Strophanthin is a very unstable and unreliable heart stimulant, and the quantity of atropine is too small. Carbolic acid would be more efficient as a corrective than naphthol.

Among the thermal agents mentioned, ice is never used as an anæsthetic, but is frequently employed to reduce inflammation, having a pronounced sedative effect. The ether spray is rarely employed, not being so effective as others of the thermal agents mentioned.

Rhigoline, one of the lighter products of petroleum distillation, is also rarely used because of its odor and the inconvenience of its application. It is a colorless liquid, of a disagreeable odor, quite volatile and inflammable, and produces an effect similar to the other volatile, freezing agents.

Chloride of ethyl is probably the most convenient and popular of the thermal agents of the present day. It is a clear, colorless liquid, possessing an agreeable, ethereal odor, and boils at 50° F. It is manufactured in France and is not found in the U. S. P. It is produced by the action of chlorine on ethyl alcohol, and is found in commerce in glass flasks which contain about three drachms. The method of application is to break the point of the flask, and after having protected the surrounding tissues, to direct the spray to the part to be anæsthetized. It evaporates very readily and causes intense cold, completely freezing the part, and rendering all slight operations painless. The best effect is produced when the flask is held at a distance of ten or twelve inches from the part, thus allowing the liquid to become vaporized before reaching the tissues. The patient should be instructed to breathe through the nose, and care should be taken that the application is not too prolonged, for if the part be too much deprived of blood, death, and subsequent sloughing of the tissue results. The anæsthetic stage is indicated by a whitening of the tissues and by the formation of ice crystals on the free margin of the gum.

Chloride of methyl, though not so extensively used, because of its greater comparative cost and the clumsiness of the apparatus in which it is contained, is a gas at 70° F. with a slight ethereal odor. It can be liquefied by pressure, and in commerce we find it in the liquid state held in copper flasks which contain about one quart.

As the chloride of ethyl, it is manufactured in France and is not found in the U. S. P. It is made from the remnants of beets used in the manufacture of beet sugar, extracting from these remnants the chlorate of tri-methylamine, which upon the addition of heat produces chloride of methyl. Its action differs from the action of the chloride of ethyl only in intensity, the former producing more cold and in less time than the latter.

## DISCUSSION.—COCAINE.—LOCAL OBTUNDENTS.

Dr. Carrow, Ann Arbor, Mich.: My learned colleague has given us some very interesting facts concerning the action of cocaine upon the lower animals. But we must bear in mind the fact that there is a great difference between experimentation upon the lower animals in the laboratory and the practical use of the drug which the pharmacist furnishes us.

I would not disparage the value of such experiments, for they are of much service to us. But when we are told that a drug has a certain effect upon the lower animals we must not think that the same drug will necessarily produce a like effect on the human animal. I have found cocaine a safe and effective anesthetic. I use a great deal of it in my practice. During the school year I have used, in my hospital practice, five ounces of cocaine. That is a large amount. In my private practice I, of course, do not use so much. Ordinarily I apply this in 4 per cent. solution, although I do use it in 6, 8, and in the nose, 10 per cent. solutions, being careful not to apply too much of the stronger solution. And yet, without exercising extreme care, either with respect to the patient or the strength of the solution, I can recall but one case where I have had trouble. In this case there was an idiosyncrasy against the use of this drug of which the patient was aware. She had a decided intermittent pulse. The operation was the removal of a truncated body which occluded the nostril. I gave her cocaine. I noticed none of the manifestations which my learned colleague has told us appear as a result of the administration of cocaine, except the irregular action of the heart. All other symptoms, dilation of the pupil, hurried respirations, etc., usually present under chloroform anæsthesia, I found in this case.

After an extensive use of this drug I am convinced that it is one of the best anæsthetic agents, at least for the ophthalmologist. I am partial to the large crystals of Parke, Davis & Co.

In operating upon the eye I drop the solution on the cornea. After four applications, made three minutes apart, two drops applied each time, the eye is sufficiently benumbed to enable me to open the eye and to perform the necessary operation without the slightest sensation on the part of the patient, and by this I mean absolutely does not feel it.

When operating upon small tumors, epithelioma of the tonsils or a small growth on the pharynx, I use about a quarter of a drachm of the 4 per cent. solution, going around every side of the tumor. The blood-letting which naturally follows the making of the incisions is sufficient to overcome what might otherwise be a dangerous tendency. I have been called in by other physicians in cases where there was exhilaration followed by extreme nervous condition and a low condition generally of the system, after the use of cocaine; and I have experienced the same thing in my own practice. But in all these cases a generous dose of whisky was sufficent to do away with all ill effects.

I think in dental practice the solutions used are not strong enough. Probably we will never arrive at the stage when anæsthesia, especially that produced by cocaine, will entirely benumb the tissues at the end of the fangs of the tooth, because we cannot reach the spot so as to deposit the cocaine there. But if the drug be applied about the superficial parts of the tooth I am sure the extraction can be accomplished without the patient having the slightest sensation. And if, instead of a one-half per cent. solution a drop or two of an 8 or 10 per cent. solution be applied to the surrounding surface before the rubber dam is adjusted, and as is so frequently the case, the thread or clamp jammed up into the alveolar process, operations would be painless and the irritation attendant upon such operations done away with.

As to the newer preparations of cocaine, which Dr. Cushny tells us are to come into general use, I would say the old preparation—hydrochlorate of cocaine—is good enough for my purpose; it is in itself a perfect drug.

Dr. Hoff, Ann Arbor, Mich.: Do you use a corrective remedy in connection with cocaine solution?

Dr. Carrow: I use simply a water solution except, in some cases, I accompany the hydrochlorate of cocaine with atropine; the effect of the atropine is greatly increased when the same quantity of hydrochlorate of cocaine is added to it.

C. P. Pruyn, D.D.S., Chicago, Ill.: Shortly after Nikolsky made his first experiments I procured some cocaine and began to use it locally, but with little effect as we used it at that time. I then began a series of experiments, using dogs for this purpose. The learned gentleman who has preceded me tells us that experiments upon dogs, and those upon man are not analogous. There are, however, many things that we need to know that can be learned only through experiments upon the lower animals. Many times I have seen symptoms that would have alarmed me had I not seen the same things when experimenting upon dogs.

Usually I procured two dozen dogs and paired them according to size and make-up. To one I gave cocaine; to its mate I administered the same dose of cocaine but first reinforced it with an antidote. For this purpose I found morphine best. I gave the morphine say twenty minutes before administering the cocaine.

I used small doses in all experiments as well as in practice. In one case five minims of a 4 per cent. solution produced marked dyspnœa. I now use altogether a 2 per cent. solution; I find I can accomplish with it all that I formerly accomplished with the 4 per cent. solution. I am surprised that Dr. Carrow should recommend such large doses. At Goshen, Indiana, death occurred from the administration of a little more than one grain.

Doubtless many of you have seen reports of this case. The gentleman was about fifty years old. He was a banker, a man of sedentary habits; he was not well preserved. He suffered from rheumatism and neuralgia and had chronic diarrhœa. He went to a dentist for an operation, as he was suffering so greatly from neuralgia. Seven or eight minims of a 2 per cent. solution of cocaine was given him and the operation performed satisfactorily. A month later he went to another dentist who gave him eight minims of a 4 per cent. solution and extracted several roots. In neither case were there toxicological effects. Ten days later, having other roots to be extracted, he went to the first dentist. This dentist had, in the mean time, seen a report of a formula published by Dr. Barrett, of Buffalo, which was as follows:

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| R. | Atropiae | $\frac{1}{10}$ grain |
| | Strophanthii | $\frac{1}{5}$ grain |
| | Cocaine mur | l grains |
| | Acidi carbolici | x grains |
| | Ol. caryophyli | 3 minims |
| | Aqua distil | j ounce |

He injected of that about ten minims, or possibly, a little more. Instantly there was a state of collapse and in twenty minutes the man was dead. Cases of this sort alarm us.

I took my little son, a lad of about ten years, to a rhinologist to have a simple operation performed on the nose. I took him about eleven o'clock in the morning, a time when digestion had taken place. The doctor applied a 10 per cent. solution of cocaine by means of a swab. The poisonous effects were manifested at once. The little lad was given aromatic spirits of ammonia and whisky. He soon recovered. A week later I again took him to the doctor, at the same hour of the day, but I gave him a cup of coffee and a sandwich as reinforcement. The same amount of the solution was used as before, but there were no ill effects. A short time after that he was taken again for a similar operation, at the same hour, but without the reinforcement. Everything was apparently all right. The operation was performed and the little fellow started from the office;

then the poison began to take effect, and it was with the greatest difficulty that he reached my own office. The spasmodic effects were very marked in this instance. I applied the usual restoratives and resorted to artificial respiration.

In the name of my profession I would like to enter a protest against the claims made for cocaine by the gentleman who preceded me. It seems to me this drug is one that should be handled with a great deal of care. In dental practice the systemic effects of the drug are more marked than in cases of amputation of limbs, for instance, for the vital nerve centers are reached through the reflexes in operations about the mouth. All these patent nostrums, put forth as specifics for pain, have as their active principle cocaine. Somebody is going to suffer; thousands have already suffered. Note the way in which rhinologists use it. There is a case of chronic catarrhal condition; perhaps an operation has been performed. A prescription containing cocaine is written out. The patient takes it and experiences relief. He gets more of it, and then a little more, and thus is established a habit far more terrible than the opium habit.

Cocaine is a good remedy. I myself use it. But do not let us abuse the good things we have. Let all who intend to make use of this drug first experiment on the lower animals that they may become familiar with its action.

A French doctor is using cocaine in oil with a little acid for preservation. He thinks the cocaine is not so readily absorbed as when used with water. I have had no experience with this myself.

Dr. Cushny: I am gratified that so high a tribute should be paid to experimental pharmacology. The experimental pharmacologist was quite aware of the anæsthetic properties of cocaine twenty years before it came into use in medical practice. You will find it described in the text-book, for example, written in 1880, in which the author described fully the local anæsthesia produced by this drug; and although this book was written four years before the introduction of the drug, cocaine is there recommended in cases of operation upon the eye and upon the larynx.

I am much surprised that so small a dose as that given in the case at Goshen should have resulted in death. It is perhaps a question whether the drug used was pure or not, and whether death was not due to shock rather than to the drug. This same question arises in connection with the use of chloroform and ether, from the use of which so many deaths occur, especially in dentistry. Many times death is caused by shock. Complete insensibility is not always produced; the nervous system is weakened both by the drug and by the shock and death results.

I think different antidotes are indicated according to the stage of poisoning. If the exhilaration reaches a sufficiently high point a narcotic, such as chloral, is indicated; in the stage of depression, undoubtedly the best drug is caffein injected subcutaneously or taken through the mouth, as suggested by Dr. Pruyn. This drug is a stimulant to the heart and to the nervous system.

The idea of using cocaine in oil is certainly a very curious one. It might retard the action of the cocaine, but before the drug takes effect it must be absorbed. I do not see that the oil is of special benefit.

**Dr. Carrow**: I feel that I must attempt to clear myself from the rather grave charge brought against me. Now, if I were to have anything done to my teeth I should want to go to such a man as Dr. Pruyn. He evidently is a close observer, and a careful and conscientious man—that is the kind of man I try to be in my own practice.

Now I do not want to advocate cocaine too strongly; I hardly know that I can. But I would like to ask this question: Because now and then death has occurred from the use of nitrous oxide, will you discard it? I think not. Because we have reports of deaths occurring from the use of chloroform, shall we empty our carboys of this drug and let our patients stand the shock occasioned the nervous system by the amputation of a limb or the removal of a tumor? I think not. Care should be exercised in using this drug, but I believe in giving it. In the case cited at Goshen, who knows what effect that particular combination of drugs may have had? I believe in a 4 per cent solution of cocaine. I make this solution fresh every morning. I take a drachm bottle which my little pipette is made to fit, and pour into it a drachm of saturated solution of boracic acid—which is as near water as you can get—then I turn out into my hand from my cocaine bottle what I think is about two grains—I never measure it exactly—and put that into the bottle. If at night any of this solution is left it is thrown away and a fresh supply made the following morning. By exercising care in this way and reinforcing the patient, as suggested by Dr. Pruyn, I ams ure no ill effects will follow, and we may proceed with the full conviction that we are doing the best possible for our patients with the sanction which science, through experimentation upon the lower animals, has given us.

I am glad Dr. Pruyn spoke of the liability of contracting the cocaine habit—a most fascinating habit. I never write out a prescription for cocaine. I buy the drug myself and often the patient is not aware what he is taking; I am particular about this, especially if I think the person morally weak; for a strong man I would have no fear.

Dr. Taft: I would like to ask Dr. Pruyn the relative effect of cocaine when applied to the surface and when injected.

Dr. Pruyn: The effect of cocaine when applied locally is not so marked as when injected. In the latter case the effect is almost instantaneous.

Dr. Watling: Have you ever had trouble with sloughing at the point where the needle is inserted? I myself am a little shy of cocaine and have not used it much. But I have often seen this trouble when the drug has been injected; it is a question in my mind whether this is caused by the drug itself or by poison on the needle.

Dr. Pruyn: I have seen this effect but think it is due usually to dirt on the needle, or perhaps to septic poison on its point, not to the drug.

Dr. Watling: Is this more likely to occur on the gums than anywhere else?

Dr. Pruyn: No.

Dr. Taft: I do not know much about cocaine, but from the results produced when it was first introduced I have always regarded it as an unsafe agent to use miscellaneously. In the use of anything to which great danger is attached, the operator should be in the best possible condition, physically and mentally; the dentist because of business pressure or physical depression, is frequently not in a condition to make clear discriminations, and I think this is the cause many times of ill results. Where a dangerous agent is employed, as in the case of cocaine, special regard should be given to this point.

Dr. Birge: At no time have tools and appliances been so perfect as at present. Yet with all our improved machinery all our advanced, scientific methods of treatment, operations upon the teeth are attended with more or less pain. How to eliminate this is a subject which is receiving more attention from the profession than any other at the present day. And here the charlatans too are active; one cannot pick up a paper that has not one or more advertisements setting forth that by using some patent nostrum teeth may be extracted without pain.

The very able papers to which we have listened this morning and the discussions upon them will certainly enable us the better to cope with this matter. But all that has been said has been along the line of extraction. I think there are many other cases in which the dentist can make good use of cocaine. In the small cavities up under the gums it is well to touch the gum with a 10 or 20 per cent solution for a few moments before adjusting the rubber dam and the clamp; you will find there is not so much complaint about the clamp's hurting. When extracting the pulp I use a spoon-pointed syringe, injecting the cocaine in and around the pulp; then open with bur and extract with a barb. This can be done without pain to the patient and enables one to clean out the pulp and fill the tooth at one sitting. I have been afraid to inject cocaine directly for extraction of teeth. As Dr. Carrow has stated, it is hardly possible to inject cocaine deep down at the apex of the root because of the alveolar process; but injection into the gums will help the first taking hold of the tooth.

I have always held it a religious duty not to inject any preparation whose formula I did not know. It is not safe nor is it just to the patient.

I have used ethyl chloride a great deal and like it. Sometimes it leaves the gums intensely red and sore; a little vaseline rubbed on will relieve this. The following formula is one which, although I have not yet used sufficiently to speak with entire confidence, will, I think, prove very good:

| | | |
|---|---|---|
| R. | Sulph. atropine | $\frac{1}{2}$ grain |
| | Strophanthin | $\frac{1}{5}$ grain |
| | Carbolic acid (95 per cent.) | v gtts |
| | Hydrochlorate cocaine | xx grains |
| | Distil. water | q. s. j fl. ounce |

I inject four to six drops hypodermically.

I think the profession should "squelch" patent nostrums, and that all dental journals advertising such remedies should be taken off the list. Dentists can make up their own formulæ; if we cease buying these nostrums they will soon be withdrawn from the market.

Dr. Bethel, Kent, Ohio: I have always been very conservative in using drugs. Cocaine I consider a very dangerous article and think it should be used very cautiously. Indeed, it is a question in my mind whether it should be used at all hypodermically, especially above a 1 or 2 per cent. solution. I think, too, a third person should be present when it is administered, just as in the case of administering chloroform or nitrous oxide. Of course, there is a question as to whether the ill effects from the use of cocaine be due to the drug itself or carelessness in using it—whether to the impure article or septic poison due to an improperly kept syringe.

There is a great demand in these days for cheap things, and in order to cheapen some articles it is necessary to adulterate them; hence, many of our dental medicines are impure, cocaine among others. Of course, to obtain the best results our drugs must be pure. On the other hand, a drug may be pure when purchased but become impure through improper care. This is a point which is very important. If possible procure all drugs in original packages from reliable dealers.

All dental societies should take some action in regard to patent nostrums. To the gentleman who spoke a few moments ago in regard to striking from the list all journals advertising patent nostrums, I would say the editor is not always responsible for the action of the publishers in advertising matters, and in justice to the publishers, I might say that many times they would prefer not to print such advertisements—they often do not receive any pay for it.

There is a great demand for painless extraction. And undoubtedly, as Dr. Taft has said, most of the formulæ on the market for producing anæsthesia contain more or less cocaine. If a formula could be obtained that would be effectual and not contain this drug it would be a great boon to the profession as well as to suffering humanity.

I give a formula which, while I do not claim it to be the ideal anæsthetic, yet is one from which I have obtained good results:

| | | |
|---|---|---|
| R. | Carbolic acid crystals | 10 grains |
| | Gum camphor | 8 grains |
| | Iodoform | $\frac{1}{2}$ drachm |
| | Listerine | 2 ounces |
| | Pond's extract of hamamelis | 2 ounces |

In the preparation of this the carbolic acid and gum camphor should be mixed first. (Gum camphor when mixed with carbolic acid crystals melts down and forms a clear liquid.) To this add the iodoform followed by the listerine and hamamelis. The bottle should be shaken occasionally for, at least, twenty-four hours. The liquid is then filtered. Iodoform has considerable anæsthetic properties; camphor is said to increase solubility of the iodoform. Not all the iodoform is dissolved and what is taken up is held mechanically in the mixture, but enough is incorporated by constant shaking.

Dr. Hoff: I have thought that if we had some formula upon which we all could report, our attention would in this way be called to the question of formula-making and in this way we might be able to do something toward doing away with quack nostrums. I offer the following for test:

| | | |
|---|---|---|
| R. | Cocaine | $\frac{1}{2}$ grain |
| | Morphine sulph | $\frac{1}{4}$ grain |
| | Atropine (tablet) | $\frac{1}{80}$ grain |
| | Carbolized water ($\frac{1}{2}$ per cent.) | xxx gtts |

As you will observe, this formula contains both morphine and atropine. Morphine acts more promptly when introduced as a preliminary drug. All three ingredients are local anæsthetics. According to Dr. Cushny's statements the whole of this preparation could be safely used. I scarcely ever use more than five or six drops for six teeth.

Dr. Taft: Every well-informed, self-respecting dentist who feels prepared for his profession should have a thorough knowledge of the things entering into his equipment. He who makes use of patent nostrums has not that knowledge. In a general way he may know of what the compound is composed, but the exact formulæ is not disclosed, for obvious reasons, and he who uses them acknowledges his own weakness; he is worshiping unknown gods.

In relying too much upon anæsthetics we are weakening our influence over our patients. There is a certain psychical power which every dentist and physician, too, has or ought to have over his patients, which causes that person to have implicit faith in whatever you may do or say. When such patients come to you and the question is asked: "Do you wish to take an anæsthetic?" reply, "Oh, no. I do not suffer very much under your hands." If we resort too freely to anæsthetics this confidence on part of the patient is destroyed. Therefore, I would say to you, especially the younger members of the profession, bear in mind that you have a power which you ought to cultivate and use for the benefit of your patient, and not throw aside for these things out of the use of which so much iniquity, danger and harm are likely to arise.

Dr. Jackson: There is one thing which has not been spoken of. How many of you are careful to use pure distilled water? It is just as easy to introduce poison into the system through the water used as in any other way. It is well, too, even if you have disinfected the instrument, to dip its point, just before using, into carbolic acid.

Dr. Pruyn was asked to give his method of injecting.

Dr. Pruyn: I do not know that my method is very different from that employed here at the University of Michigan. I use a hypodermic glass barrel syringe with a minim gauge on the flange. This gauge I consider very important. On my own instrument there is a little bar on the piston which can be set at any point on the gauge. By using this sort of instrument there is no danger of injecting more of the fluid than is intended. I have cut off the point about one half; the ordinary hypodermic syringe point is too long for our work. A fine point is best, but not one so fine as to be too elastic.

I think the point of Dr. Jackson's a very good one. Even when sterilized water is used it is well to dip the point of the instrument into some antiseptic solution, for disease germs floating about in the air may have been deposited there. Bichloride solution, or a week solution of cinnamon water are, I think, preferable to carbolic acid. The cinnamon solution need not be strong enough to act as an escharotic solution is apt to weaken it; for that reason cinnamon is perhaps better for this purpose.

Dr. Parker: I have found very good results from the injection of *aqua pura*. I have tried this remedy in perhaps half a dozen cases of broken roots. It works admirably. No bad effects follow its use, and according to the patients, operations under it are painless. Probably this is the result of the psychological effect spoken of by Dr. Taft.

Dr. Pruyn: I have used this same valuable prescription in many cases and I could not distinguish the slightest difference between its effect—so far as sense of pain is concerned—and those of a 4 per cent solution of cocaine. I have had no sloughing nor ill effect of any kind. I have imagined that better results were obtained when warm water was used.

Dr. Parker: I have thought it best to use water just as cold as I could.

Dr. Pruyn: I have thought that perhaps the effect from use of water came from pressure upon the nerve terminal filaments. There may be something in this.

A Member: A young lady presented herself to me to have some roots extracted. She had been told to ask for cocaine or something of that kind. I offered nitrous oxide but she did not wish to take that. I applied extract of hamamelis and extracted three teeth *painlessly*.

# SELECTIONS.

## Right-Sightedness and Left-Sightedness.

BY M. DE CAMARASA.

Are you right-sighted or left-sighted ? Nowadays, good shots generally shoot with both eyes open. How are they able to aim, —that is, to bring the object, the two sights of the gun, and the eyes in line ? It is impossible to bring more than one eye into the line of sight. Nevertheless, sportsmen assure you that they sight with both eyes, and in fact, at the moment of firing they have both eyes open.

To test the matter, take a piece of card or stiff paper, and make a hole through it with a slender pencil, and, holding it at a little distance before your eyes, look through it, with both eyes open, at a spot on another card lying before you on the table. When you sight this spot, close first one eye, then open it and close the other, and you will find that one eye only is in line with the hole and the dot. It is the same with the sportsman who shoots with both eyes open, one eye only is brought into play. The experiment may be varied by pointing with the finger at a small object several yards distant, when, on closing each eye in turn, it will be found that only one of them is in the line of sight.

Many sportsmen who shoot with both eyes open are excellent shots, and many who formerly shot with one eye closed have changed their method. They are convinced that shooting with both eyes open has real advantages. The object can be seen better, and the distance calculated better, and, at the moment of pressing the trigger, the muscular effort necessary to the closing of one eye is avoided. Many persons, indeed, are unable to close each eye in turn while keeping the other open. Moreover, people are right-sighted or left-sighted just as they are right-handed or left-handed ; that is to say, one eye is more efficient than the other. A person whose right eye is deficient must modify a little the position of the head or of the arms, in order to bring the left eye into line. But there are guns made especially for sportsmen in whom the sight of the right eye is defective, the stocks being so bent that the left eye can be used for sight without change of the normal position. The stock and barrels in fact are aligned on different planes, the distance between which is equal to the distance between the two eyes.

When a gun-maker is making a gun for a person who shoots with both eyes open, it is, therefore, important to know whether the marksman is right-sighted or left-sighted. Of course a left-sighted person may learn to shoot from the left shoulder, but for a right-handed man this requires an apprenticeship. As a matter of fact, most people are right-sighted, but the exceptions are sufficiently numerous to render it prudent to determine the point before having a gun made to order. It is of course possible to bring the other eye into the line of sight, but the stronger eye falls naturally into it.

But the prime object of this article is not to discuss the advantages and inconveniencies of shooting with one eye or with both eyes open, whether with weapons of the chase or with weapons of war. I am led to the subject simply because I was assured by an old soldier that he had spent many days under arrest because he was not able to close the left eye when taking aim. The case is assuredly not an isolated one; and I ask myself, would it not be more rational to instruct military marksmen to shoot, as so many civilians do, with both eyes open, a method which does away at once with needless efforts, grimaces and possible punishment?

Apart from this, marksmen are not the only persons who, having to work with one eye at a time, work with both eyes open, even for the most delicate work; watchmakers, microscopists and others do the same successfully, and thereby effect an economy of effort.

In the course of my experience, I have met a great many people who have never thought of whether they are right sighted or left-sighted. I believe, however, it may be asserted without fear of error, (1) that it is possible to utilize one eye only while both are open; (2) that there are right-sighted and left-sighted persons; (3) that a person is ordinarily ignorant of whether he is right-sighted or left-sighted until he has made it a matter of experiment; and (4) that the eye to which a person devotes the attention and the will—in other words, the eye with which he regards an object—is the one with which he sees it.

The last fact is sufficiently demonstrated by the experience of microscopists. It may be also verified by taking two paper tubes, putting one to each eye, opening them at a considerable angle, so as to allow the eyes to fall on two pages of reading-matter at some distance apart. By an effort of will one can read with either eye, but while one eye is occupied the other rests.—*La Nature, Paris, April* 14.

## COMMENCEMENTS.

### National University—Dental Department.

The annual commencement exercises of the Dental Department of the National University were held, in connection with those of the Medical Department, at Metzerott's Music Hall, Washington, D. C., on Tuesday evening, May 15, 1894.

The address to the graduating classes was delivered by Prof. George C. Ober, M.D., and the valedictory address by J. Edwin Waterbury, D.D.S.

The number of matriculates for the session was twenty-eight.

The degree of D.D.S. was conferred on the following graduates by the Chancellor of the University, Hon. Arthur MacArthur, LL.D.:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| Barney Babcock | New York | John A. McAfee | Texas |
| Ransom L. Caton | Alabama | John B. Reeves | Illinois |
| William C. Cannon | Illinois | Walter F. Schricker | Missouri |
| Frederick F. Daly | Dist. of Columbia | J. Edwin Waterbury | California |

Total, 8.

## Southern Medical College—Dental Department.

The seventh annual commencement exercises of the Dental Department of the Southern Medical College were held in College Hall, Atlanta, Ga., February 27, 1894.

The annual address to the students was delivered by T. W. Latham, and the valedictory by W. C. Mattox.

The number of matriculates for the session was thirty-one.

The degree of D.D.S. was conferred on the following graduates by T. S. Powell, M.D., President of the Board of Trustees:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| W. B. Fuller | Florida | W. C. Mattox | Tennessee |
| Arno Knorr | Georgia | W. H. Wooldridge | Texas |

Total, 4.

## Birmingham Dental College.

The commencement exercises of the Birmingham Dental College were held in Seal's Music Hall, Birmingham, Ala., Wednesday evening, March 7, 1894.

The address to the graduating class was delivered by Capt. W. C. Ward, and the valedictory by D. C. Cosby, D.D.S.

The number of matriculates for the session was twenty-seven.

The degree of D.D.S. was conferred on the following graduates by the Dean, T. M. Allen, D.D.S.:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| Drury C. Cosby | Alabama | William P. Stinson | Alabama |
| John H. Rice | Alabama | | |

Total, 3.

## University of Pennsylvania—Department of Dentistry.

The fifteenth annual commencement of the Department of Dentistry of the University of Pennsylvania was held in the American Academy of Music, Philadelphia, on Thursday, June 7, 1894.

The number of matriculates for the session was two hundred and thirty-one.

An address was delivered by Louis A. Duhring, M.D., Professor of Skin Diseases.

The degree of D.D.S. was conferred on the following graduates by William Pepper, M.D., LL.D., Provost of the University:

| NAME. | RESIDENCE. |
|---|---|
| Antonio d' Avila | Brazil |
| Miles C. Barner | Pennsylvania |
| Marcel Barral | France |
| John R. A Berry | Switzerland |
| George R. Blanchard, jr. | Pennsylvania |
| Hans Block | Germany |
| Frederick L. Bogue | New Jersey |
| Frederic H. Bowers | Illinois |
| D. Paton Boyd, L.D.S | Scotland |
| Harry B. Butler | New York |
| John J. Cush | Pennsylvania |
| F. A. Delabarre, A.B. | Massachusetts |
| Wilson D. DeLong, M.D. | Pennsylvania |
| John Dunlop, L.D.S | Scotland |
| Theodore C. Edgar | Iowa |
| Rudolph Erler | New York |
| George H. Finch | Virginia |
| Harley B. Fowler | Wisconsin |
| Martin Freund, Ph.D. | Germany |
| Mendel Friedland | Russia |
| Lewis H. Gilman | Pennsylvania |
| August Hafner | Switzerland |
| Wilhelm Harres | Germany |
| J. Irvin Hatch | Pennsylvania |
| E. Foster Hazell | Illinois |
| Joseph M. Hill | Pennsylvania |
| John E. Horgan | Pennsylvania |
| Raymond W. Hunter | Massachusetts |
| Arthur T. Kenney | Australia |
| Emil W. Kuehn | Minnesota |
| Robert Lavanchy | Switzerland |
| Frederick A. Lewis | Iowa |
| Marquis D. Littig | Iowa |
| J. T. Lippincott, D.D.S. | Pennsylvania |
| George E. Longeway | Canada |
| Harry G. Maize | Pennsylvania |
| Edward J. Marfing | Pennsylvania |
| Walter S. Marlow | England |
| Herant B. Matteossian, A.B. | Turkey |
| Carl Mosberg | Germany |
| Albert Newgarden | Pennsylvania |
| Peter O'Donnell | Pennsylvania |
| John P. Oliver, L.D.S. | England |
| Thurlow G. Patterson | New York |
| Charles F. Portz | Pennsylvania |
| J. Martin Raugh, D.D.S | Iowa |
| Guy C. Robb | Pennsylvania |
| John A. Robeson | North Carolina |
| Walther Rosendahl | Germany |
| Ernst Rosenthal | Germany |
| Philip H. Seibel, M.D | California |
| Lourival M. de Souza | Brazil |
| D. Ambrose Stein | Pennsylvania |
| Charles E. Stine | Pennsylvania |
| John W. Storer | West Virginia |
| Campbell C. Taggart | Pennsylvania |
| Howard S. Taylor | Delaware |
| Fred. M. Thiesen | Germany |
| Harold Tyndale | Pennsylvania |
| Victor de Trey | Switzerland |
| Arthur D. Weakly | Illinois |
| B. Frank Witmer | Pennsylvania |
| William J. Wray | Pennsylvania |
| Wilson Zerfing | Pennsylvania |

Total, 64.

JUNE 16, 1893.

| NAME. | RESIDENCE. |
|---|---|
| Joseph M. McDowell | Pennsylvania |

Total, 65.

◆

## College of Dental Surgery of the University of Michigan.

The nineteenth annual commencement of the Dental Department of the University of Michigan was held, in connection with the commencement exercises of the other departments, in University Hall, Ann Arbor, Thursday, June 28th, 1894.

The number of matriculates for the session was one hundred and eighty-five.

The annual commencement oration was delivered by George Herbert Palmer, A.M.

The degree of D.D.S. was conferred on the following candidates by the President of the University, James B. Angell, LL.D.:

| NAME. | RESIDENCE. |
|---|---|
| Delia C. O. Adams | Michigan |
| Frank P. Adams | Indiana |
| Chas. Francis Amsden | Ohio |
| Otto Anderson | Michigan |
| Adelbert H. Babcock | Michigan |
| Edwin Irving Backus | Indiana |
| Andrew S. Bailey, B.S., Lawrence University | Wisconsin |
| Roy Edwin Bailey | Michigan |
| Fred. Wm. Blake | Michigan |
| Henry M. Bridgman, | Natal, Africa |
| Damon Isaiah Butler | Michigan |
| Thomas S. Buzzard | Michigan |
| Anthony J. Casey | Michigan |
| Chas. Douglas Cassidy | New York |
| Frederick H. Codding | Michigan |
| Estus Hammond Coller | Michigan |
| Gerald Willard Collins | Michigan |
| Robt. Edgar Davies | New York |
| Frank B. Dawley | Michigan |
| James King Douglas | Ohio |
| William Booth Elster | Nebraska |
| Edward Leigh Gedney | Minnesota |
| William E. Goucher. | Michigan |
| Myron Perry Green | Michigan |
| Harry Loyal Griswold | Illinois |
| Alfred Whipple Hall | Michigan |
| William Anthony Hart | Michigan |
| Garrett S. Hartley | Pennsylvania |
| Charles P. Haselden | Massachusetts |
| George Elba Hathaway | Michigan |
| William J. Higgins. | Michigan |
| John Louis Hoover | Indiana |
| Homer F. Hussey, Ph.B., Earlham College | Indiana |
| George Renshaw Johnson | Michigan |
| George W. Kenson | Wisconsin |
| Allen Huyler Kessler. | Michigan |
| Joseph Lathrop, jr. | Michigan |
| Chas. Cummings Lick | Michigan |
| Mary Linde | Germany |
| Robt. Bruce Mackenzie | Michigan |
| Michael J. McCormick, Rockburn | Province of Quebec |
| Chas. A. McGettigan, jr | California |
| James Archibald McIndoe | Wisconsin |
| Walter Chas. McKinney | Michigan |
| Anna Katharine Miller | Michigan |
| Chas. Lester Mitchell | Ohio |
| Albert Francis Monroe | Michigan |
| Geo. McWilliams Moore | Wisconsin |
| Miles Jacob Moyer | Michigan |
| Allen Eugene Mulder | Michigan |
| Forest Joseph Overholt | Michigan |
| Barnum Herbert Pearce. | Ohio |
| Benj. Franklin Pearce | California |
| Geo. Andrew Servis | Michigan |
| Carrie M. Stewart | Texas |
| Harvey A. Sturdevant | Colorado |
| Dean Nathaniel Swift | Ontario |
| Chas. Henry Terry | Illinois |
| Chas. Reed Vanderbelt | New York |
| Albert Wesley Weible | North Dakota |
| Chas. Traver Whinery | Ohio |
| Walter Morey Wilkins | Michigan |
| Wallace V. Wolvin | Michigan |
| George Philip Wurster | Michigan |

Total, 64.

◆

## Columbian University—Dental Department.

The seventh annual commencement of the Dental Department of the Columbian University was held at University Hall, Washington, D. C., on Thursday, May 3, 1894, at 8:30 P. M.

The address to the graduates was delivered by Prof. R. B. Donaldson, D.D.S., and the valedictory by John H. Galloway, D.D.S.

The number of matriculates for the session was twenty-eight.

The degree of D.D.S. was conferred on the following graduates by J. C. Welling, LL.D., President of the University:

| NAME. | RESIDENCE. |
|---|---|
| Chester H. Beatty | Dis't of Columbia |
| John H. Galloway | Iowa |
| Walter A. Low | Virginia |
| William A. Lyon | Connecticut |
| Herbert MacNamee | New York |
| Frederick W. Parker | New York |
| Charles S. Rice, M.D | Pennsylvania |
| T. Guy Songster | Dis't of Columbia |

Total, 8.

# NOTICES.

The American Dental Society of Europe will hold its nineteenth meeting at Geneva, Switzerland, August 6th, 7th and 8th, 1894. Last year this annual gathering was omitted, as many members wished to attend the Columbian Dental Congress. American colleagues who may be taking a summer vacation-abroad are cordially urged to combine with their plans for travel and sight-seeing a visit to their professional brethren in Europe and to join in the various exercises of the occasion. Members of the profession everywhere will be welcome. Programmes may be had on application to the President, Dr. L. C. Bryan, of Basel, or to the undersigned,

Chas. W. Jenkins, Secretary
No. 1, Sonnenquai, Zurich.

# EDITORIAL.

## The American Dental Association.

The thirty-fourth annual session of the American Dental Association will be held at Old Point Comfort, Va., commencing at ten o'clock A. M., Tuesday, August 7, 1894.

Geo. H. Cushing, Recording Secretary.

J. N. Crouse, Chairman of the Executive Committee, 2231 Prairie Ave., Chicago, gives notice that arrangements have been made for a reduction in raiload fare, upon which he says: "We expect a reduction of one and one-third fare for the round trip on the certificate plan. In order to get this reduction full fare must be paid in going to the meeting, and a receipt taken therefor from the ticket agent at the starting point. This receipt must be countersigned by the secretary of the association, at the meeting, and will enable the holder to return for one-third fare, provided one hundred certificates are presented."

To the above we will add that the round trip from Cincinnati to Old Point Comfort will be one fare, fifteen dollars and seventy cents. It may be well from many points west of Cincinnati, southwest and northwest to make arrangements with the roads to Cincinnati, then take advantage of this rate from Cincinnati.

Arrangements will be made to give stop-over tickets at places of resort, as the members may desire.

## National Association of Dental Faculties.

This body will meet at the Hygeia Hotel, Old Point Comfort, on the 4th of August, at ten o'clock A. M., and hold its sessions that day and the 6th.

The Executive Committee of this body will meet at the Hygeia Hotel on Friday, the third of August, at ten o'clock A. M., to prepare business for the general sessions. All interested please make special note of this fact.

## Professional Ethics.

Prior to the graduation of the class of the College of Dental Surgery, of the University of Michigan the following article was prepared and signed by all of the members of the graduating class. It consists simply in an agreement or promise to abide by the requirements of the code of ethics of the American Dental Association and of all other dental association in affiliation with that body. Such an agreement exercises a wholesome influence upon all who promise to conform to its requirements, it also, in a good measure, affords a degree of moral support and strength to everyone, and constitutes a bond of union that should not be lightly esteemed. It is as follows:

"To maintain its dignity and to further the honor of the profession which I am about entering, and in loyalty to my Alma Mater and the desire and precepts of its faculty. I the undersigned do willingly and cheerfully promise to abide by the code of ethic of the American Dental Association, and will strive to deport myself in such manner as to claim the respect of the public, the good will of my co-workers in the profession, and the continued esteem of my instructors and brother graduates. If at any time, I should fail to so act, I shall expect to forfeit all claims to personal or professional recognition by my Alma Mater and classmates."

## A New Dental College.

A new dental college was organized about a year ago in Tacoma, State of Washington, and recently brought to a close its first session.

The faculty consists of the leading men of the profession in that city; and from information we have received they have done excellent work during the term just closed. They, of course, labor under embarrassment, incident to a new enterprise and to being so far distant, almost amounting to isolation, from other institutions of a similar character. It is to be hoped, however, that at a very early day these difficulties will all be cleared away, and that an institution as good as the best shall grow out of this beginning.

## Removal.

The Editorial office of the Dental Register was removed July 1st, 1894, from No. 122 W. 7th Street to No. 12 Berkshire Building corner of Elm St., and Shillito Ave. Also the offices of Drs. J. Taft and Wm. Taft to the same place.

## The Southern Dental Association.

The annual meeting of the Southern Dental Association will be held at Old Point Comfort, Virginia, August 2, 3, 4 and 6, inclusive. A large and interesting meeting is anticipated and a cordial welcome extended to all members of the profession.

Stomatology or Dentistry; which?

# THE DENTAL REGISTER.

VOL. XLVIII.] AUGUST, 1894. [No. 8.

## COMMUNICATIONS.

### Restoratives and Resuscitants.

BY N. S. HOFF, D.D.S.

Read before the 38th Annual Session of the Michigan Dental Association.

The consideration of the various means and methods of obtaining painless dentistry by this association would not, it seems to me, be complete without some time and thought spent in an especial consideration of the various means and measures that can be called into use, in case the poisonous influences of the anæsthetic make themselves manifest. All persons who have made any considerable use of anæsthetics have discovered that very inconvenient and dangerous symptoms are liable to manifest themselves at times when least expected, and it may be, when the operator is least fortified with antagonizing remedies. Those who have made little or no use of them know from reading of these disagreeable manifestations. Is it not probable that lack of intelligence as to the manner of action and proper use of anæsthetics, also in the selection and administration of restorative remedies, and the management of cases requiring them, deter many from giving their patients the benefit of painless operations even when most urgently indicated?

In directing your attention to this subject it is not my purpose to attempt an exhaustive treatment of it, but only to bring together in as concise and practical form as I am capable of doing, the approved methods of proceeding in the various accidents occurring from the use of anæsthetics. My personal experience has never brought me in contact with many of the more serious aspects of the subject, and you will, I am sure, pardon my assurance in attempting to write upon the subject at all. But the necessities of the occasion forced the subject upon me, and I have made my best endeavor with the time at my disposal, and the meager material I have been able to get from text-books on the subject.

My endeavor is to present the most widely-accepted theories as to the nature of these difficulties and the best means for meeting them, and where it is at all possible to state some of the principles in definite terms. The treatment of the subject will be confined to the accidents which are liable to occur when using the accepted anæsthetics—chloroform, ether, nitrous oxide and cocaine. For convenience in memorizing we will class the remedial agents under two heads, Restoratives and Resuscitants.

*Restoratives* are the more simple means of stimulation through the reflexes of the vital organs in order to hasten their restoration to normal function, and for those conditions which usually present no alarming indications.

*Resuscitants* are indicated when the conditions require a more or less prompt and vigorous interference to prevent dangerous tendencies or fatal results. The restoratives are all that are ordinarily called for, yet occasionally more active measures are needed, and when such times come, they come suddenly and with little or no warning. Usually these excessive prostrations are the result of concealed or unknown systemic disorders which make themselves known under the prostrating influences of a general anæsthetic. In order that we may more freely grasp this subject it may be well for us to outline the events which are liable to take place and the means by which they are produced, and under each to outline the treatment and give reason for selecting the remedies indicated.

If we look closely into this subject we will find that it is impracticable to make definite distinctions between the several different effects produced by anæsthetics, for oftentimes two or more of the effects we shall describe will be found in a single case. We also find that the same treatment, that is to say, the same remedies will be indicated in different conditions because of this close association of symptoms and effects produced. The only object in making this distinct classification is that it may help to retain the matter in memory in a systematic and rational form.

The accidents liable to be encountered in the administration of anæsthetics are: syncope, cardiac failure, shock and asphyxia. There are, of course, many other incidental or accidental happenings which have nothing to do with the quality of the anæsthetic or condition of the patient, but which come entirely from carelessness or bungling on the part of the operator or his assistant. These we will not take time to consider as they are such palpable errors of judgment or evidence of incompetency that this paper would not be long enough to enumerate and explain them, and no classification would hold them.

Syncope is the sudden lowering of the blood-pressure to the extent of producing cerebral anæmia and unconsciousness. The blood-pressure may be lowered by the heart itself: (1) by the lessened force and frequency of its beat; (2) by the action of the depressor nerve on the vaso-constrictor center, inhibiting its action to make it accord with a feeble or depressed heart; (3) by emotional excitement or shock which cause inhibition of the vaso-constrictor center; (4) by the action of an anæsthetic on the heart producing a direct depressing effect upon the heart muscle or ganglia, and through its afferent depressor nerve an unusual effect is produced on the already excited vaso-motor center.

In syncope the manifest symptoms are sudden blanching of the skin, relaxation of the muscular system, apparent unconsciousness and feeble pulse. The respiration is continuous but shallow. The patient has neither power nor inclination to stand or sit upright, but falls limp and relaxed. These symptoms are due to the depleted or clogged condition of the blood-supply in the central nervous system. Usually the blood collects because of gravitation in the abdominal vascular system which is largely relaxed and dilated. Sometimes there is lack of tone in the arterial system and consequent stasis in the arterioles and capillaries.

Evidently, then, the remedies indicated are such as will restore the relaxed arterial and cardiac systems, and supply the brain with proper nutrient blood. The force of gravity has much to do with the depleting of the brain, especially if the patient be standing or sitting upright. When the extensive vascular system of the abdomen is relaxed, it is capable of containing a large part of the entire blood-supply of the system; and in syncope the blood quickly finds its way to this part of the body causing a depletion of the more elevated portions of the body. In order that this condition may be corrected the patient must be placed in a recumbent position, and if possible with the head a little lower than the body, but in an easy and natural position. In addition, such remedies should be administered as will increase the power of the heart-beat. Oftentimes simple reflex stimulation is all that will be needed. Draughts of cold air, washing the face with a towel or sponge wet with cold water, the inhalation of volatile irritants such as spirits of camphor or aqua ammonia. If the syncope is more profound and does not yield readily to these remedies, inversion, sometimes with a pendulum movement, or nitrite of amyl will usually give quick response. This is a poisonous drug and should be used with discretion. It is ordinarily administered in from three to five drops, by placing it on a napkin or handkerchief and allowing the patient to inhale three or four times the vapor from the napkin held a few inches from the nostrils. If used in this way and then withdrawn there is a decided quickening of the heart-beat and of respiration. But if its use be continued its action would be harmful, as it produces further dilation of the arterial system. Its use would be indicated in syncope from shock in patients of average good health where the arterial tone was normally good. In chronic invalids suffering from diseases which have impaired the circulatory and nervous systems, and where the patient does not quickly respond to reflex restoratives, and there seems to be no continuous improvement under the most active reflex stimulant, a restorative having a more positive and continuous action is indicated. Such a remedy we have in tincture of digitalis which is a powerful heart stimulant and also excites the vaso-constrictor nervous system. The action of digitalis is to render the heart-beat somewhat slower but of very much more force, at the same time its action upon the vaso-constrictors contracts the arteries of the abdomen so that they drive the venous blood back to the heart and lungs, and by raising the blood-pressure throughout the entire system the normal blood circulation is restored, and consequently its function. Digitalis, either by direct action or because of its action upon the circulation, causes more or less quickening of respiration. There are two preparations of digitalis which may be used: the alcoholic tincture and the alkaloid digitalin. The tincture is preferable, as digitalin is a more or less uncertain compound, and its use is sometimes attended with considerable local irritation, and the results are not as satisfactory as the tincture. The dose of digitalin is $\frac{1}{50}$ of a grain well diluted. The dose of the tincture is xx to xxx drops injected hypodermically into the arm. When using digitalis the patient should be kept quiet and in a recumbent position, as any effort on his part to rise will bring on syncope, by the effort made in rising and the gravitation of the blood to the abdomen and extremities. The patient should be kept warm, and the beat of heart may be very much increased by the application of cloths wrung out of very hot water and placed on the chest over the heart.

In certain diseases more or less caution should be exercised in the application of restorative remedies, otherwise fatal results may follow. All diseases of the arteries, aneurisms, atheromas and fatty hearts would contra-indicate excessive excitement of the circulation, because of possible hemorrhage, or apoplexia.

Cardiac failure may imply more or less depression of the heart function or entire cessation. It is due to the action of various depressing agents on a normal or good heart, or more frequently to these same depressing influences on a heart weakened by disease or impaired by congenital or accidental defects.

Cardiac failure of a sound heart has been sufficiently considered under syncope. But the action of drugs upon a diseased or deformed heart are sometimes very prompt, and baffle all attempts of restoration or resuscitation. Valvular and some congenital deformities are not liable to lead to cardiac failure even under somewhat prolonged depressing anæsthetics, but such diseases as fatty degeneration, indicated by a feeble and irregular action, lack of power, interrupted breathing, etc., are very unfavorable indications for a depressing anæsthetic, such as chloroform. Cautious practitioners will decline to administer such anæsthetics as are liable to produce excessive heart prostration when the heart is known to be weakened from disease. But it sometimes becomes necessary to make use of these depressing anæsthetics even when the conditions are present; or they may be so obscured as not to be recognized by the operator.

There usually accompanies such conditions more or less disturbance of the circulatory system, and, may be, also, considerable nervous disorder, and the effects are, in some respects, similar to syncope, but more desperate. There generally occurs prompt depression of the circulatory and respiratory functions with their peculiar symptoms, and in fatal cases death occurs very promptly with little or no chance for the application of restoratives, and efforts to revive the patient will be futile. Where there is tendency to impaired circulation from disease the restorative remedy should precede rather than follow the administration, and this practice is specially indicated in the conditions here spoken of. The use of alcohol in the form of whisky or brandy is strongly advocated for this condition. It should always be given before the administration and never afterward. The benefit from it is not so much its stimulant value, but its strengthening or tonic effect enables a weak heart to endure the depressing action of the anæsthetic without succumbing. Some authorities advocate one or two ounces given a short time before administering the anæsthetic, others go so far as to make the patient comfortably drunk.

More definite stimulation and fortification of the vital organs is obtained by preliminary administration of digitalis for a day or two previous to the administration, or hypodermically a few hours previous. If accidents occur after these precautions all that can be done is to withdraw the anæsthetic and apply such restoratives as are indicated. If the heart is affected the stimulants mentioned under syncope; recumbent position, reflex stimulants, hot applications over the heart and digitalis hypodermically. If there be respiratory complications, sulphate of strychnine $\frac{1}{50}$ of a grain in one drachm of water hypodermically. In some cases artificial respiration may be indicated.

The next dangerous condition is known as "shock." This term seems to have a more or less wide application and its seriousness will depend upon its form and extent, and also upon the physical condition of the patient. In many cases there is a condition resembling or tending toward shock, produced upon healthy, young or timid patients by fear. It may terminate in syncope or asphyxia, but usually the application of the anæsthetic produces sufficient excitement and comfortable feeling to ward it off and overcome it entirely. There is a condition known as "traumatic shock," produced by injuries, during which it is very questionable whether an anæsthetic should be employed even to lessen the pain of large operations. Again, there is a condition of shock which occurs during the administration of an anæsthetic, which is produced because of painful impressions made upon the vital nerve centers by the afferent nerves from a tissue upon which the surgeon is attempting an operation without waiting for complete anæsthesia. This occurs because these nerve centers are already much depressed by the anæsthetic, but are still irritable, and when the impression comes it makes so strong an attack upon them that they succumb very quickly. Chloroform and cocaine anæsthesia produce this form of shock oftener than ether or nitrous oxide, because the former irritate and depress the nerve centers, while the latter excite and stimulate them. The symptoms of slight shock are confusion, giddiness, pallor, tumultuous heart-beat, spasmodic breathing, sometimes profuse sweating. Generally these symptoms will pass away without the application of remedial agents. The anæsthetic should be withdrawn, the patient put in a recumbent position and warm wraps applied to the body, clothing should be loosened and mild reflex stimulants applied to the face, fanning and rubbing or stroking the hands, warm applications to the feet, and warm tea if the patient can drink without strangling. In severe shock there is pallor, fainting, coldness, trembling, small fluttering pulse, great mental depression, incoherent speech, cold sweat, nausea, vomiting and often great reduction of temperature.

There is great difference of susceptibility of patients to shock, and of the same person at different times. As a rule, young, full-blooded and active people are exempt from shock under anæsthetics, while people inclined to faint, nervous and anæmic people are more susceptible. Sometimes secondary effects follow severe shock, due to the powerful impression made on the nervous system. They take the form of headache, sleeplessness, disturbed mental function, chorea (irregular convulsion of the limbs), cardiac and vascular disturbances, irregular breathing and general mental and physical depression.

We cannot positively affirm that drugs, such as we use as anæsthetics, produce all the features of surgical shock, but the symptoms above outlined so closely resemble the toxic effect of cocaine that we may be justified in treating these effects on much the same principles as shock from a traumatic injury. Anæsthetics produce inhibition of the vaso-constrictor nerve centers and produce syncope, and large doses of chloroform or cocaine produce paralysis of the central nervous and vaso-motor systems producing severe shock, and often fatal effects.

The treatment indicated for severe shock is the same as above indicated in ordinary shock. In addition stronger reflex stimulation and the use of stimulating enemas, and hypodermic injections to meet the indications ; digitalis for failure of the heart and strychnine for respiratory failure. In shock from injury attended with pain $\frac{1}{4}$ grain of sulphate of morphine should be given. This would be indicated in shock from the administration of cocaine. As morphine counteracts the exciting tendencies of cocaine at almost every point. It should be used in all formulæ for hypodermic applications of cocaine as a prevention of the toxic effects of cocaine.

Asphyxia is the most common accident encountered in practical anæsthesia and, in many instances, the most difficult one to manage successfully.

It is usually defined as "suspended animation." This does not convey much idea of the way life is suspended, and we shall need to consider its characteristic action to get a clear conception.

Asphyxia, in general terms, is produced by paralysis of the respiratory nerve center and may occur from doses of toxic drugs, such as hydrocyanic acid or carbolic acid; or from overdoses of various anæsthetics, chloroform, etc.; or from the accumulation of venous blood in the circulatory system. These causes are more specifically stated by Harley, in an orderly system to be:

First: The exclusion of air from the lungs by various obstructions to the air passages, such as pressure on the chest or throat, smothering, paralysis of the respiratory muscles because of injury to the spinal cord, wounds into the chest admitting air, foreign bodies in the fauces or larynx, diseases obstructing the air passages, tumors, œdema of the glottis, accumulated mucus, drowning, etc.

Second: Exclusion of oxygen from the lungs by the inhalation of a harmless gas, such as anæsthetic vapors. In the inhalation of nitrous oxide, all oxygen is excluded from the lungs, and that which the blood contained becomes used up and converted into carbon dioxide which is not destroyed by the nitrous oxide, but circulates as a poisonous element to depress the function of the vital nerve centers.

Third: The inhalation of corrosive or poisonous gases or vapors, such as chlorine and carbonic acid gas.

From this it will be seen that these conditions may be present or result from the use of many of our general anæsthetics. The venous or poisonous blood together with the depressing anæsthetic cause profound impression to be made upon the vital nerve centers. The anæsthetics are present first and produce their characteristic effects first of excitement and then of depression of all the higher nerve centers, according to Jackson, in the order of their organization. The highest, the cerebrum first, then the cord in its sensory function, then the special nerve centers of the medulla oblongata, lastly the motor nerves and muscles. During this regular action of the anæsthetic the blood is continually becoming venous in character for want of oxygen and giving no support to these nerve centers and muscles, and, what is worse, even acting as poisons, causing suddenly the function of the life center to stop and consequently of the vital organs controlled by it. Direct paralysis of the function of respiration and circulation would occur in this way and suspended animation is the result. It is also probable that the heart, arteries, lungs and the other vital organs of the system are greatly influenced by the circulation of this venous blood. The heart muscle and the vaso-motor nervous system would undoubtedly be affected by it and the circulation would relax from muscle and nerve poison producing heart failure and syncope combined; also local effects in addition to the central influence of the anæsthetic and poisonous circulation. We can then state our definition of asphyxia with more clearness, as due to the direct depressing action of a depressing anæsthetic, and of vitiated blood upon the respiratory, cardiac and other vital nerve control centers, and to the local poisonous effects of venous blood circulating in the arterial system, depriving the tissues and vital organs of needed sustenance. Asphyxia may be produced in any one or all of the above ways. The peculiar selective action of different anæsthetics are taken into account when these symptoms appear, and all means adopted for restoration or resuscitation must take into account not only the manifest symptoms, but the peculiarity of the drug's action, and the condition of the patient, as treatment will depend largely upon these considerations. But in asphyxia there is one symptom always prominent and demanding immediate treatment. This is failure of respiration.

There are three methods of resuscitation employed in asphyxia.

First: Remove the anæsthetic and also remove any obstruction to the admission of air freely.

Second: Employ artificial respiration and, possibly, reflex stimulants.

Third: Administer restorative drugs either by mouth if possible, hypodermically, or by enemeta. If there is any apparent or suspected interference with the air passages to the lungs, it should be promptly removed. Foreign bodies may become lodged in the trachea or larynx, such as vomited matter, false teeth, extracted tooth, mouth props, mucus, etc. These are sufficient to continue the asphyxia if not removed. If the muscles of the respiratory apparatus, especially of the glottis, are depressed and there is failure of this function, the head should be thrown back and "with the index finger of each hand upon the corresponding cornua of the hyoid bone, whilst the middle fingers rest upon the angle of the jaw, then press forward and upward, the same force serving to extend the head upon the neck; if this fails to open the glottis, by means of a tenaculum, thrust far back into the base of the tongue, draw it forward." (Wood.) If some foreign substance has become lodged in the air passages and owing to the impossibility of recovering it, as sometimes occurs because of the powerful occlusion of the jaws, the operation of laryngotomy or tracheotomy will have to be performed.

Laryngotomy is a simpler operation than tracheotomy and should be made by the operator where such an operation is demanded to save life and no surgeon is at hand to perform it. This operation is made, according to Errichsen, "by making a vertical incision in the median line between the sterno-hyoid muscles, about an inch in length, exposing the crico-thyroid membrane, which is subcutaneous, then perforating this membrane with a transverse cut, with an ordinary scalpel." This artificial opening should be kept open with a tracheotomy tube. The only danger is from hemorrhage in case the transverse cut is made too long the anterior jugular vein may be severed. Artificial respiration can then be set up until the normal function is restored.

If no impediment to respiration exists in the air passages, reflex stimulants are indicated; the use of volatile irritant vapors, such as ammonia, nitrite of amyl, rubbing the face until warm and then dashing cold water upon it, and if insufficient accompanied with artificial respiration. When artificial respiration is indicated, it will usually suffice to simply raise the patient's arms and then bring them down against his sides, so as to compress the abdominal walls. In raising the arms the air is brought into the lungs and the compression again forces it out. These motions kept up at about the regular rate of breathing will induce natural respiration. In some cases where there is entire collapse a more complete and systematic artificial respiration will need to be used. The Sylvester, Hall or Howard method, one or the other, are generally adopted. These methods are so familiar that no description need be given of them here. In practicing artificial respiration, do nothing roughly or excitedly. The respirations should not be made over fifteen per minute, and compression rather than concussion should be aimed at. The administration of drugs to excite the respiration by affecting the respiratory center is one of the most approved methods of resuscitation. The best drug for this purpose, according to Wood, is strychnine. It should be given in the form of sulphate of strychnine in $\frac{1}{50}$ grain in one drachm of water injected hypodermically. If the respiratory centers are not too deeply paralyzed this will excite them and renew the respiratory function. Digitalis is sometimes used, but it has no specific respiratory stimulating function, and any benefit it may have would result from its action upon the heart. If there be also heart paralysis, both drugs should be given. Although strychnine alone seems from clinical evidence to have a certain amount of value as a heart stimulant.

There are many other remedies advocated as restoratives and resuscitants, and they are used with a measure of success; but our space and time would not permit a discussion of their comparative merits. My effort has been to briefly outline the conditions and their nature so far as this can be made out and to class with each condition the most approved remedies.

If it be considered wrong for one who does not understand the nature of the action of anæsthetics to administer them, it certainly is wrong for any one to administer any anæsthetic without providing adequate restorative remedies, and having them conveniently at hand in case they are required, and for this purpose I would propose the following list of remedies to be kept in a special apartment or cabinet for those who comtemplate the administration of general anæsthetics.

A wide-mouth two-ounce bottle filled one-half with cotton saturated with ammonia; two-ounce bottle of aqua ammonia; two-ounce bottle of aromatic spirits of ammonia; nitrite of amyl in five drop tears; one-half pint of whisky; one ounce tincture of digitalis; sulphate of strychnine in one-fiftieth of a grain tablets; caffeine in three-grain capsules; two, one drachm and in good working order, hypodermic syringes; a small galvanic battery; tongue forceps; gag for opening the mouth; pair of long-handled pharyngeal forceps; tenaculum hook; an instrument for laryngotomy, scalpel, tenaculum hooks and tracheotomy tube.

## DISCUSSION.

Dr. A. W. Diack: It is vary rarely that we come in contact with the more serious collapsed conditions, these come into the hands of surgeons in cases where more dangerous operations are performed. Then, up to the present time, we have confined ourselves almost entirely to nitrous oxide, the effects of which are not so serious. But we all realize that with the introduction of cocaine we are more liable to meet with such conditions, especially syncope and heart failure. The paper to which we have just listened is exceedingly valuable if for nothing more than the pathological phenomena so clearly set forth. There are two additional conditions which I would mention.

Cases of epilepsy, just after being operated upon are often thrown into a tetanic state—that is, spasm of all the muscles of the body; this state for the time being is very alarming, as those who have witnessed it are well aware. My treatment would be nitrite of amyl, that being considered a specific.

Sometimes extremely nervous persons will exhibit symptoms so closely resembling cardiac failure that it is only after the usual remedies are applied without effect that we discover the condition to be hysteria instead of shock. My treatment of an ordinary case of shock is to use aqua ammonia. It is harmless, and, in the ordinary cases with which we have to deal, effective. If something stronger is needed I use nitrite of amyl. We are here dealing with a remedy that shoots both ways—especially in cases where patient has weak circulation. This drug has an effect upon the heart in so far as it allows inhibition. It has a depressing effect, however, and is not a stimulant. If this does not have the desired effect, I inject aromatic spirits of ammonia or brandy; brandy is more harmless. Give hypodermically twenty drops with about $\frac{1}{6}$ of a grain of morphine, thus obtaining the combined effects of morphine and brandy. Digitalis I would give very shortly after the brandy. In very serious cases I should call in a physician if for nothing more than to take the responsibility. If a death occurs in our chair we have no right to sign a death certificate and a coroner's inquest must be held—a somewhat embarrassing thing to have happen in one's office. Such a thing will, in public opinion, do much toward lowering the esteem in which we may be held. Therefore, call a physician.

Dr. Hoff has spoken almost entirely of the pathological conditions. I would like to say a word about preventive means. We should look at the causes which bring about those conditions. Persons often faint from fright, mere nervousness. This can be overcome by gentle manipulation; often it is best not to let the patient sit in the chair at all. Bromide of potassium is useful here, also. Again, sheer weakness—from disease or old age—will often produce heart failure. Such cases should be treated with stimulants, or morphine.

When there is traumatic shock—when the nerve or remnants of the pulp have been extracted without an anæsthetic—there seems to be an interval of normal condition a few moments after the operation followed by syncope. During this interval attract the patient's attention—give a glass of water and tell her to take a long drink, get her mind fixed upon something outside of herself. Many time, I have avoided syncope by this method.

In regard to traumatic shock just before the anæsthetic period, I have doubts as to whether there is such a thing.

Those most apt to suffer from syncope are patients whose daily occupation is hard manual labor, where the muscles are exercised all day long. Sudden collapse is more liable to occur in such cases than in any other, unless it be cigarette patients.

Dr. W. T. Williams: I do not think dentists need ever use very powerful anæsthetics. Nitrous oxide and cocaine answer our purpose. However, it is well for the dentist to be qualified to take care of patients should they manifest dangerous symptoms. A novel method employed by a medical professor for restoring a patient after the administration of chloroform struck me as very useful. He placed the patient over his shoulder, back to back, with face down, and with the patient in that position walked quickly about the room. This, he claims, empties the ventricles of the heart, clears the throat and starts the heart to beating.

DR. CARROW: I do not recall that Dr. Hoff gave in his list of restoratives sulphate of atropin to be given hypodermically in case of extreme shock; if he did not mention it I would like to say that I have been very much gratified with the results of the drug upon the motor system.

The suggestion just offered by Dr. Williams of inverting the patient is a most reliable remedy and one always at hand. I have performed one or two operations upon patients while they were in that position. One was the case of a little child too young to allow me to make use of local anæsthetis. I used chloroform. During the administration of the anæsthetic the child gave every evidence of dying. It was inverted and when it began to breathe again, but before it had come entirely out of the influence of the chloroform, I performed iridectomy. The child was out of the influence of the anæsthetic while I was still performing the operation. Of course, by the use of a tilting chair we can get a similar effect, but it is better to suspend the patient.

DR. TAFT: The question of fortification of the patient before performing operations is one not to be overlooked; indeed, it cannot be emphasized too strongly. Patients should be thoroughly examined; one should become familiar with their idiosyncrasies, should make a study of the constitutional conditions, and such prior treatment given as may fortify against disastrous results.

In connection with the subject of inversion of the patient. I will cite a case described by Dr. Jay, of Richmond, Ind. He had administered chloroform. There was a very sudden sinking away, and it was evident that death was near that patient. He inverted the patient and soon there seemed to be complete recovery. But not long after he noticed a blanching of the face; he immediately resorted to inversion and again carried his burden about the room. This procedure he carried on at intervals for perhaps two hours and a half, and finally succeeded in bringing about complete restoration.

In my own practice during the early days of chloroform I had rather a peculiar experience. A healthy, robust-looking girl came to my office to have some teeth extracted. I called in a physician and she was given chloroform. She seemed to recover all right, but in about fifteen minutes she began to smile, then to laugh, and then to laugh hysterically, and finally she went into convulsions. We succeeded in bringing her out of that condition. But not long after she again began to smile—to me, a most sardonic smile—then came heavy stertorous breathing, and then she fell into a sleep. For three days these various conditions were gone through with. Even on the third day she had two or three slight attacks but after that she seemed entirely recovered. I think there must have been a predisposition to hysterical condition that the chloroform brought out. But that was in the early days of chloroform, when the drug was not so well known as now.

There is one point we should bear in mind. Because we have so many good methods of restoring patients, we should not go on carelessly giving anæsthetics, confident that these methods will answer in every emergency, but in many cases preventive measures should be employed, as I before stated.

Dr. Long, Monroe, Mich.: An ounce of preventive is worth a pound of cure. The operator should be on the alert and as soon as there is the slightest sign of collapse he should administer restoratives, even though the symptoms are not very alarming. This is one of our strongholds, I think.

## Hypnotism.

BY PROFESSOR GEO. H. MEAD.

Digest of paper read before the Thirty-eighth Annual Meeting of the Michigan Dental Association.

Treatment of disease by suggestion goes back even to prehistoric times. The means by which this suggestion was brought about was through the belief in the charms, ceremonials and rites practiced, but the principle was the same as in the most modern methods of hypnotic therapeutics.

Hypnotism can be approached from two sides—the psychical and the physiological. On the psychical we have to describe the state of consciousness of the person hypnotized, on the physiological the state of the physical organism during the condition.

The positive action of suggestion is perfectly normal. Every suggestion that we received, either through words spoken to us, or through signs given consciously or unconsciously, or through objects which suggest actions tends to be carried out, and if we follow out our obscure states of consciousness we will find these tendencies even when they are checked almost before we recognize them. Hypnotism consists in removing the checks and counter-suggestion by which we direct our actions. So far as we can describe such a condition there must be a great dimness of background and environment in the midst of which the single suggestion stands out with relative distinctness. The whole pathological condition in the hypnotic state consists in the rendering dim and indistinct of the background and environment of consciousness by means of which we judge of the value and propriety of actions and in which we find the counter-suggestions by which we check or direct any particular suggestion.

On the physiological side we must suppose a change in the co-ordination of the central nervous system, such that one line of central reflex is not connected with the other paths, which would, under ordinary circumstances, check or modify or direct its expression. Further than such a general account we are not as yet able to go in any physiological statement of the hypnotic state.

On the therapeutical side we are justified in using hypnotism for all those diseases in which suggestion has worked already in producing pathological conditions, and also in such functional diseases as allow of regulation through suggestion acting by means of the higher nervous centers. But especially is hypnotism allowable in cases where, as in dentistry, there is need of a local obtundent or anæsthetic.

### DISCUSSION.

Dr. Parker, Grand Rapids, Mich.: I would like to cite a case of hypnotism. The patient was a person of more than ordinary ability, clear sighted, not easily deceived. She had made a study of this subject to some extent. She came to me for an operation. As her teeth were extremely sensitive I determined to hypnotize her. I told her this. I told her I wanted her to go to sleep, not entirely asleep, but just far enough to dream. After two or three minutes I said to her "Here is a book. I want you to take it and go down to M——. There is a hammock down there and I want you to have a good time." I then began filling the tooth. I worked for about two hours—it was a large gold filling. After finishing my work, I woke her up by snapping my fingers. She awoke with a start. "Oh, doctor, I have had such a nice time. I have been down to M——. I had a hammock there and such a nice book to read." I asked her what the book was about. "I do not recall any particular part of it, but it was very interesting." She was much surprised when I told her what I had been doing, and of course was very grateful.

Hypnotism is certainly a wonderful thing and a power for good, but it is also, in the hands of the unscrupulous, a power for ill.

Dr. J. L. Sweetnam, Manistee, Mich.: It is a question in my mind whether it is right or not for a person to use the hypnotic power. There is no question whatever about it being possible to put persons into a state of insensibility to pain by this means, but is it right for dentists to use this power? I became quite enthusiastic at one time about this subject and made use of it in my practice successfully. I could extract teeth, and live pulp without the least pain to the patient. But I found it reacted against me in the minds of my patrons, and fearing it would injure my practice I stopped it. What I want to find out, is, what position this practice is likely to take in dentistry. I do not wish to sacrifice my practice, nor do I wish to go on alone.

## Anæsthetizing Sensitive Dentine.

BY W. H. VAN DEMAN, D.D.S.

Read before the 38th, Annual Meeting of the Michigan Dental Association.

Much has been said by the dental profession upon the means of obtunding the sensibility of the dentine. It is a matter which is of the greatest importance for the fear of pain during the excavation of cavities is, probably, the most common cause for neglect of the teeth.

If we are to eliminate pain from an operation, we should first study its cause and the means by which it is transmitted to the seat of realization.

When we examine the dentine under the microscope, we see that from the pulp cavity to the periphery, the tissue is perforated by small tubes or canals having distinct walls; each tube starting by an open circular mouth upon the surface of the pulp cavity, radiating in an undulating course, giving off many branches which freely anastomose or communicate with each other. They terminate either by gradually fading out, by anastomosis, by ending in loops, or in the interglobular spaces. It has been thought by some that these tubes pass into the enamel and cementum, but this has not yet been proved.

Each tube has a definite wall or lining that may be demonstrated, even in fossil teeth. These tubes are not mere bony canals in the matrix, but each tube is lined with a definite, delicate, and yet indestructible structure, the dentinal sheath of Neumann. Rose has proven this sheath to be nothing more than the remains of uncalcified dentinal ground-substance which has experienced some chemical change, by which it has become resistant to acids and alkalies.

What are the contents of these tubules? It is now definitely known that on the inner surface of the dentine, or better, on the outer surface of the pulp, we have a layer of highly differentiated connective tissue cells, called the odontoblasts, and that through the activity of these cells the dentine is deposited. From these odontoblasts, we find protoplasmic processes of various lengths, extending up into the dental tubules, and here constitute the so-called Tomes dentinal fibers. Some have thought these fibers to come from cells deeper seated in the pulp tissue, below the odontoblasts, but Rose has shown, and his work has been accepted by V. V. Ebner and others, that Tomes fibers are simply protoplasmic processes of the highest differentiated connective tissue cells, the odontoblasts.

Can such processes transmit sensation? It has been thought they can and do. By some the odontoblast has been likened to the amoeba. The amoeba is protoplasm which resembles undifferentiated protoplasm of higher forms; its protoplasm has the power of assimilation, conductivity and reproduction. The odontoblast has no such power, they can not properly be compared at all. One of the most interesting and important facts is, that there is only a single layer of odontoblasts which remain active throughout the life of the tooth.

We have certainly no reason to believe that the protoplasmic processes of the odontoblasts can conduct sensations. Nowhere in the body does a connective tissue cell have such a function, yet there is no doubt but what the sensitiveness of the dentine is due to the contents of the tubules.

May we not have something more than a protoplasmic process enclosed within each of these tubules? Boll, who has probably done the best work on the nerve ending of the tooth, has traced the fibrillæ from the pulp up between the odontoblasts, and believes they may extend on into the tubuli. To me, this is the rational view. I see no reason why we should not expect such an ending of the nerves in the tooth. There is much work yet to be done on the peripheral distribution of the nervous system, however, and it would be unwise to assume that we know all about the nerve structure of the tooth.

Sensitive Dentine is generally physiological, but we know that it is in some instances purely pathological, and in such cases we have what may be called an inflamed or hypersensitive condition.

The term inflammation has been objected to by some, because all the phenomena of inflammation, as it appears in other tissues, are not present, or at least, are not perceptible. Redness, heat, pain and swelling are the four signs distinctive of inflammation, but it is not essential that these should all exist to have inflammation. In inflamed or hypersensitive dentine we always have pain, and may have redness and heat, although the latter may not be perceptible, but owing to the dense structure of the dentine, never swelling.

Some have said "We can not have inflammation of the dentine, because the dentine has no circulation." But the dentine is a living tissue, and all living tissue requires constant nourishment, and is constantly giving off waste products.

How is the dentine nourished and what becomes of its waste products? As yet I have been unable to determine. According to Townsend and others, "We know that the largest of the tubuli are far too small to admit the blood corpuscles, but there is no reason why the blood plasma, or some fluid having like properties, should not enter the tubuli, supply the structure with the necessary nourishment, gather up the waste products, and pass out, by which a circulation is established in each tubule directly connected with that of the pulp."

If this be true, it is easy to explain why it is that we find the dentine of a tooth in which the pulp has, from any cause, become inflamed so fearfully sensitive. If the pulp be treated and restored to its normal condition the sensibility of the dentine is reduced. As to whether either of the terms, inflammation or hypersensitiveness of the dentine, are scientifically correct I have my doubts; of the two, I prefer the latter.

The methods of obtunding sensitive dentine may be classed under three heads: Physical Processes, Medications and Instrumentation.

As Physical Processes we may consider the application of heat and cold. We all know that, oftentimes, by the simple drying out of the dentine with warm air its sensibility is greatly reduced. If we use absolute alcohol, then warm air, this is accomplished much more readily and effectually. When we apply heat we do nothing more than dehydrate the dentine, and just to the extent that we dry up the contents of the tubuli will the normal function of the fiber be reduced. Some have suggested drying out the tubuli in this manner, then filling them with some one of the essential oils, believing that in this way they could prolong the period of insensibility. I believe this wholly unnecessary and dangerous, to the extent that the tooth may be discolored by the deposit from the coloring matter of the oil used.

The cold-producing agents, such as ether spray, chloride of ethyl and chloride of methyl, act upon the dentine by freezing up the contents of the tubuli, thus obtunding their sensibility. The chloride of methyl is probably the best one of these agents. In the cavity to be treated should be placed a piece of cotton saturated in glycerine, then the spray thrown on the cotton. This will lessen the pain considerably, although all cold-producing agents, while effective, are more or less painful.

As Medications we may use caustics (potential caustics) as nitrate of silver, chloride of zinc, carbolic acid and its combinations, as Robinson's remedy and Black's 1, 2, 3 solution.

Nitrate of silver, when applied to sensitive dentine, acts on the contents of the tubuli, destroying its vitality to the extent of the combination which takes place. The objections to its use, which I believe sufficient to exclude it altogether, are the discoloration it causes and its superficial action, being escharotic rather than caustic.

Chloride of zinc, while painful, is a most valuable obtunding agent. Its painful action may be modified by bathing the sensitive surface, prior to the application of the chloride, with chloroform, tincture of aconite or atropine solution. It is very penetrating, and in no case should be used where there is danger of irritating the pulp of the tooth.

Carbolic acid being an antiseptic as well as an escharotic, makes a very valuable agent as an obtundent. Often exceedingly sensitive dentine can be relieved by simply applying carbolic acid, and drying out with hot air. The action is much more rapid and effective, however, if the drug be combined with either alcohol, chloroform or ether. Robinson's remedy, composed of equal parts of carbolic acid and caustic potash, and Black's 1, 2, 3 are often very effective. All of these caustics act by simply coagulating the contents of the tubuli.

Instrumentation, or the use of thoroughly-sharpened instruments, I believe to be the most important of all the methods of obtunding sensitive dentine. Sharp excavators skillfully used will, in many cases, be all that is needed, even retaining forms may be made with the excavators in extreme cases. When the bur in the engine is used it should be sharp and the engine run slowly so as to prevent the generation of excessive heat, which will always cause great pain. Under this head also might be considered the matter of gaining the perfect confidence of the patient. This is, no doubt, of great importance.

### DISCUSSION.

C. B. Blackmar, D.D.S.: About a month ago Dr. Hoff called at my office and informed me that the entire subject to be presented at our meeting here this year would be "Painless Dentistry."

He also said that one of the papers to be read was on the subject of "Obtundents for Sensitive Dentine" from purely a theoretical standpoint, and he desired a practical, operating dentist to open the discussion and asked if I would do it? As I am simply to open the discussion I am going to do so from a practical, business standpoint.

In regard to the paper just read by Dr. Van Deman I would like to say that if any dentist with good common sense will sit down and have the contents of the tubuli frozen with the agents mentioned I am sure he will not call it painless dentistry. And I am quite sure that the dentist who uses, as the paper states, Robinson's remedy, chloride of zinc, oil cassia, etc., will wish for something better before he can call the excavating of dentine painless dentistry. To my mind, practically, the excavating of diseased dentine with an obtundent is a very different thing from excavating healthy dentine, and, by the way, a patient with a bad bringing up combined with a streak of ugliness and a bad temper will, usually derive very little or no benefit from local obtundents. There is one thing I wished to say last night, I will say it now, and that is, in regard to a physician giving chloroform, etc., for us. I never allow one to do it in *my* office but in *his*, and if anything goes wrong, or unpleasant happens, or the patient dies, the victim is in the physician's office and *not* mine. The physician has the whole responsibility.

Last summer I saw a patient undergoing an operation by a dentist using a so-called "Painless Process." She said it did not hurt. Her friend with her, a patient of one of the best dentists in Detroit, said to her as she sat in the chair, "Then I am going to ask Dr. —— if he uses anything now he never did for me before?" This Detroit dentist's answer to her a month later was that it was a fraud, a fake, a humbug, that there was nothing one could put into or around a tooth that would make it hurt less when operated upon. Now, if this statement is so, I am surprised that this subject should be even mentioned by Dr. Hoff at our State Meeting, for we are not supposed to discuss fakes.

Dr. Case once told me that it was a fact that so-called quacks were the first to "catch on to" new remedies and schemes before the regular practitioners did, and these remedies would generally be called fakes at first. A patient told me this summer that she had cocaine applied to her gums in New York City in 1885 to relieve pain from ligatures, etc.

When was it first taught in our dental colleges? Why is it that young dental graduates do not know about some of these things, or all of them, before the quacks, so-called? I think they should be ready to meet them instead of being annoyed, and made to cope with them.

It has been said that people who are ill often get well by the aid of medicine. Some get well without any medicine, and others get well in spite of medicine, and so it is in regard to diseased teeth, that some are filled painlessly by the aid of medicine, some without any medicine and others in spite of medicine, and some are cleaned out and filled with a good deal of pain in spite of all we can do, at present, to avoid it. And some patients are so sensitive in regard to their teeth that scraping on the rubber dam clamp causes them pain. Obtundents for sensitive denine are of little use in such cases. However, it is a fact that certain drugs rightly used will obtund sensitive dentine, so much so, at least, that the extracting can be done with less pain than without, and patients will often say that it was entirely painless, even when before operating the cavity could scarcely be touched without pain.

The right use of any drug is a nice thing. So also it is a satisfactory procedure to use one's patients right. This makes me think of the answer a professor in the State Normal School gave a boy who asked him if there were not two ways to spell a certain word. His answer was. "Yes, a right way and a wrong way."

Did any of you ever notice how some dentists adjust the velvet rubber dam? Is it painless? Did any of you ever have that soft floss silk slipped in between your teeth down on to and into your gum by one of those dentists who does not believe in so-called "Painless Dentistry?" Was it painless? Could it have been made less painful? I think it could. And the rubber dam clamp—did you ever feel one? And yet Dr. Rhein, of New York, in the *Dental Cosmos*, says he is sorry for the dentist who cannot adjust one painlessly. Did any of you ever let some brother dentist try to find an exposed pulp with an instrument just big enough to fit into the exposure and make pressure on the nerve? Did you call that painless? Did you ever see a dentist trying to obtund sensitive dentine by drawing in alcohol vapor from a lamp and blowing it out into the cavity with a chip blower, producing hot and cold blasts alternately, after medicating the cavity with oil cassia, etc., and the dentist wondering why the drug did not work? I have seen a dentist take an excavator to put arsenic into one tooth, the pulp of which he wanted to destroy, and use the same excavator, uncleaned, to clean out another cavity and wonder why that tooth pained afterward. Usually in such cases, if they are reported, the name, age, nationality, sex, color of hair, etc., would be given, but the arsenic would not be mentioned.

"Delicacy of manipulation is what must be acquired by a dentist to be successful," says Dr. Geo- H. Cushing, of Chicago. It includes nearly everything a dentist has to do. Imagine a dentist trying an obtundent—a drug—on sensitive dentine, and then cutting the dentine with a dull bur. Do you think he will regard the obtundent successful? Or the patient think differently from him? A friend of mine, a fine operator, a professor in a dental college, often would adjust a rubber dam, put in an obtundent in the cavity of a tooth and leave the patient while he shaved himself in his laboratory, wrote a letter or read a chapter or so, and upon his return wonder why the patient called the whole operation painful. I once saw a professor in a dental college tell a lady to hold perfectly still as he was not going to hurt her at all and at the same time he took a chisel-shaped excavator and exposed two pulps. After her scream he said: "Why, did that hurt you?" "Mercy, yes," she said. "That's good, I wanted it to. I had to do that way to treat them," the professor replied. Now, do you think that woman could be made to believe and feel that that man would do work for her, or even look at a tooth without pain to her?

Did any of you ever have an aching sore tooth and be obliged to have your assistant or student, in whom you had little faith, dig or probe into it to see if he could tell, for you, what made it ache? Did it not seem to you that every move he made went direct into the pulp, when in reality he might have been scraping on the rubber-dam clamp simply? But how differently you sat in the chair a few days after when you had gone to a neighbor dentist, in another city perhaps, one in whom you had perfect confidence that he would do just what was right and be accurate and careful. You all know of the many cases on record of death from fright and you all know the influence of one's mind over the body during any trying ordeal. A clipping will, perhaps, make my meaning clearer.

### IMAGINARY PAIN—A CURIOUS EXPERIMENT AT THE PERFORMANCE OF A SURGICAL OPERATION.

"The pain experienced in surgical operations is largely in the imagination of the patient," remarked Dr. W. C. Tousley, of Kansas City. "I once had occasion to perform an operation on a man where it became necessary for me to use the knife twice. After the first part of the operation was over the man declared he could not stand any more, as the pain was more than he could bear. Convinced that the suffering was more imaginary than real, I resorted to this ruse: I called in my assistant and told him to tie a bandage over the man's eyes, which I said was saturated with a soothing lotion which would allay the pain. I then told my assistant to grasp the man's hands and hold them firmly. Then I told the patient to lie perfectly still, and when I said 'Ready!' to prepare himself for the ordeal. I then went to work and in a short time finished the operation, the man remaining perfectly quiet all the time. After the operation was completed I called out 'Ready!' at the same time barely touching the wound with the handle of the knife. The man let out such a roar as I never heard before, and declared I was killing him, struggling with might and main to get free. When told that the operation had been finished without his realizing it, he would scarcely believe it."

Mind-curists or Christian Scientists believe pain can be entirely relieved by putting the mind in a certain condition.

It has been said that a dentist should have a tooth filled himself once a week in order to treat his patients decently—and I think so, too. Dentists generally are not as careful as they ought to be. They forget many times that they are working on living tissue. I think "Painless Dentistry" should be called dentistry with less pain than usual. So-called "Painless Dentistry" I think has done a good deal toward making dentists in general think more about being careful. A patient noticing that a dentist is trying to relieve any little pain and doing little things accurately will have confidence in that dentist that when it does hurt a good deal he is doing his best to have it hurt as little as possible. Why, I believe a dentist should try to have his patients have as much confidence in him in this respect as the S. S. White Co. tries to have us dentists have in the superiority of their burs. But whether a dentist should advertise his work to his patients in the way the S. S. White Co. does its goods to us, I suppose would be a question to some dentists.

This subject of "Painless Dentistry" has placed upon the market a large number of obtundents—our dental depots and agents advising us to use this and that.

Dr. Hoff says he is continually getting letters from students who have graduated and gone to practicing and who have encountered quacks here and there who were extracting teeth painlessly and asking no fees, and it hurt the recent graduates' practice so much that they had nothing to do. Now, who is to blame? If a graduate cannot convince the people that he can pull teeth better than a quack, then he is to blame. If a quack can pull teeth better, and has a right to pull teeth according to the laws of this State, he is not to blame and the people are not to blame for going to him. But if the dental profession, or we will say this body of dentists, know that the quack does mischief to the people rather than good there is a way of letting the people know it. There is a way of getting laws so that the young graduate will be rightly appreciated. But it is not the way to make the young graduate lie down and keep quiet until such a time comes. For at present he is obliged, in a business way, to try to get a practice under laws which allow quackish methods. There was a time when dentists in this State were annoyed by unprepared men practicing dentistry. It is not so now. Dentists used to be constantly called upon to give patients "vitalized air," but I have scarcely heard the words used since the time Professor Watling's resolution was before this association and was copied into the daily presses and so educated the people, showing them that "vitalized air" was simply chloroform mixed with nitrous oxide gas; showing the people, the patients, that they were being fooled by the quacks, so-called, and the people appreciated it. And so I say about these young men who are so annoyed, that I think they should be allowed to show or be helped to show the people, their patients, that the quack is wrong. If the quack is wrong (and he should be rather than the regular practitioner) and it can be shown clearly and positively to the people, it will not be long before the young graduate will have the practice he deserves. Business principles mixed with professional principles would remedy it all.

Dr. L. E. Custer: One point I would like to speak of—the part imagination plays in dental operations, especially the cutting of sensitive dentine. Imagination is a subjective faculty. We have to deal with a mental activity. The impressions are brought to the mind of the patient through the several senses and the pain felt through these agencies is, for the time being, most real; the sense of sight, for instance. A grand display of instruments in dentist's office is all very well in its way. Such instruments enable him to do excellent work and are essential, but they should be kept out of sight of the patient. The sense of smell has its influence, too. The odor of iodine, for instance, will bring to the mind of the patient painful memories; the odor of carbolic acid and creosote have a like effect upon the minds of some patients. The sense of hearing is another agency through which imaginary pain is felt. I think that in the case of ladies, particularly, who are accustomed to the quiet of the household, the pain is aggravated by the noisy surroundings in a dentist's office.

Personal magnetism should be exercised as much as possible by the operator. He should treat his patients as though they were living, sensitive human beings. He should inspire them with confidence in himself and his ability to perform the required operation. He should keep them as quiet as possible and guard against all irritation to the senses of sight, hearing and smell.

Dr. Barbour: I think the best results are obtained by running the engine slowly. Use a smooth-running engine, and a sharp bur, bearing on lightly. One has better control of the bur, and certainly there is less friction and less pain than when more pressure is used.

Dr. Lathrop: I have always thought it was best to run the engine rapidly, using a sharp bur and light pressure.

Dr. Field: I heartily endorse what the last gentleman has said. I use a very sharp bur—a dull one I throw away—and run the engine just as fast as I can, just touching the tooth, and lifting the bur from time to time so that if any undue heat be generated, it has time to cool in lowering.

Dr. Moore: I have never been able to satisfy myself that a rapid-running engine was better than one run slowly. I think a fairly good size bur, well sharpened and run rather slowly, with a good pressure will do better work. Rapid running causes more friction and more heat, and it is the heat I think that causes the pain.

Dr. Watling: It is, I think, a very hard matter to decide which is best to use, a rapid or a slow movement of the engine. I have had a great deal of experience in excavating teeth, perhaps more than anybody else here, and I have never fully decided as to which is better. But I am rather inclined to agree with Dr. Moore. An excavator well sharpened does the work with less pain than the bur. Why? Because there is no friction, and personally I think I prefer it to the bur.

Dr. Parker: I believe that pain is always the result of pressure upon some nerve. Whichever method produces the least pressure will cause the least pain. Another element is time. The excavator produces less pressure, and hence less pain, because less time is taken.

Dr. Siddall: Much of the pain felt during dental operations is mental rather than physical. If we have a patient who thinks he is going to be hurt, that person invariably will be hurt. If the operation can only be done so quietly and quickly that he does not realize what is being done, there is not apt to be so much pain. The engine makes more noise than the excavator, and that I believe is why more pain is felt when it is used. I am confident that nine-tenths of the pain experienced is imaginary. Of course a great many things do hurt, and hurt badly, but in the majority of cases the pain is mental rather than physical.

## Electricity and "Painless Dentistry."

BY L. E. CUSTER, B.S., D.D.S., DAYTON, OHIO.

Read before the 38th, Annual Meeting of the Michigan Dental Association.

No one has told us what it is, yet it is an agent in the formation, growth and death of all animal and vegetable organisms; it came with the light and the heat giving the breath of life and the magic of colors. It is the unseen hand at work in nature, the cause of barometric changes, and the formidable agent which now and then shatters and tears the atmosphere, terrifying you with the crash of its thunder. It is that which transmits the enchantment of a look and the grace of a smile. It lights and heats our homes, it runs our factories and cars, and will soon carry our voice around the globe. In this decade when everything fairly sparkles with electrical phenomena it is not surprising that an agent which exhibits such a variety of wonders and which promises still more, should find a place in dental practice. At the same time, in the present state of the public mind, no agent can be more delusive in the hands of a fairly-skilled dental charlatan than electricity; yet when intelligently used by the careful operator, even in its present limited application, it goes far toward mitigating the pain of many operations. There is perhaps no broader field for the application of the various forms of electricity than in dental practice.

The similarity between the transmission of nerve force along a nerve fiber and electricity along a conductor is so marked that it is quite natural, at first thought, to suppose it possible to apply an electric current to a nerve force in such a manner and strength as to stop the neural activity and thus prevent the transmission of sensation. Indeed, DuBois-Raymond says: "If the galvanic current moves through the nerve in the same direction as the nerve current, the intensity of the latter is increased and the nerve current is diminished in intensity by the passage of the galvanic current in the opposite direction." But the effective application of electricity to the above end as a specific obtundent is so uncertain that with our present knowledge it is not practical. This statement may be a disappointment to some, but it is nevertheless true.

The profession has experimented with electrical anæsthesia since 1851. At first it created such a furore as to be called the "lightning anæsthetic." Many dentists and surgeons engaged in its use, but it was so erratic in its action that it was finally thrown aside by the more intelligent practitioners. It has been used more or less ever since, however, by the charlatans and that class of people who maintain that there *must* be some virtue in so wonderful an agent. They have given it new names, they have put it in new boxes; but whether it is the "electric vibrator" with musical accompaniment, it is the same old foadic current of forty years ago. Its application is painful. According as the current is increased the actual pain is overcome by a greater, the electrical pain. It is a matter of choice with the patient whether he will have substituted an electrical pain for the real. The substitution of one kind of pain for another is not professional. The shocking machine which does this is of no real value. Our object is to lessen the pain. When we can successfully balance neural activity by an application of electricity in such a manner as to be painless, as well as effective and practical, then we can speak of such a thing as electrical anæsthesia.

It is not absolutely necessary that electricity be an obtundent itself for admission into dental practice. There are other ways in which it can be advantageously used for reducing the pain of many dental operations, and in this connection I will state that reference to a few electrical instruments of my own device is not for any commercial purpose. These instruments have all been made to meet some need in my own practice and are here presented as illustrations of the subject at hand.

If, with the aid of electricity, we can shorten an operation without increasing the pain, we have done a good thing, or if in the same amount of time we can perform a better operation, we are progressive. The constant potential of one hundred and ten volts is the ideal current for dental purposes. It is perfectly safe. It furnishes an abundance of power for the engine and heat for the heaviest cautery. It gives the best of light, and is admirably adapted for electrolytic purposes.

The perfection of electric motive power for the dental engine can only be fully appreciated by one who has used it. The demand has been made for a sharp bur revolved at a high rate of speed for the painless removal of sensitive dentine. This is perfectly met by the electric motor. It not only gives a much higher rate of speed than is obtainable by other power but the variations of speed by means of the rheostat is under the perfect control of the operator. The bur may be instantly stopped or its direction reversed so that there is little damage to the tooth, gum or rubber cloth by accidental movement of the instrument.

A most important recommendation also of electric motive power is that the body of the operator may be perfectly quiet, so that the control of the hand-piece is much more delicate than where the treadle engine is used.

Electric heat depends upon two factors—the quantity of the current and the size and the conductive power of the conductor. It differs in some respects from heat produced by the combustion of gas or alcohol and for certain purposes these new qualities make it a valuable agent in dental practice. It may seem that the simple process of annealing gold does not bear upon "painless dentistry," but if the contour of a large gold filling has dropped off by the imperfect cohesion of a smoked, gased or poorly-annealed piece of gold, necessitating a second operation with all the pain and fatigue that such cases mean, not to speak of the mortification to the dentist, I would say it has a most direct bearing. The heat produced by electrically heating a mat of coiled platinum wire is the cleanest, most uniform and most accurately controlled of all forms of heat. The cohesive property of pure gold is supposed to be developed by heating to such a temperature as to drive off the gases condensed upon its surface, principal of which is ammonia. The alcohol and Bunsen flame are ordinarily used for this purpose, but who is certain but that better results may not be obtained by subjecting to a heat free from the products of combustion as well as to the danger of smoking and the exposure to unconsumed gases? The electric annealer effectually overcomes these dangers. The heat being derived from electrically-heated platinum, one of the noble metals, is absolutely free from gas of any kind. The heat derived from a mat of platinum coils is quite uniform at all parts so that the gold is not only thoroughly annealed but to the same degree. It is impossible to evenly heat a piece of gold held with a pair of pliers over a flame of any kind. The thin edges of the gold will be fused while the part between the pliers will be scarcely warm. "Balling" of gold is due almost entirely to unequal annealing. At a clinic not long ago I witnessed an operator annealing gold pellets with a pair of foil carriers the points of which were broad as the pellet itself. The result was that the exposed edges of the pellet were a fused mass while the part between the plier points was not even made to cohere. The result was that the unannealed portion was not cohesive and the annealed portion so stiff that it was with difficulty that enough surface was brought in actual contact to cohere. No wonder such operators lay the blame with the gold! The accuracy with which electrical heat can be controlled also recommends its use for annealing. By means of the rheostat any degree of heat to the melting point of platinum may be obtained. From my experience with the electric annealer, however, I find that cohesion is developed at a much lower degree than at first supposed. It is never necessary to heat even to redness alone, fusion. The heat may be so low that the gold may be subjected to it for hours or for days even without any injury and still be highly cohesive. If it were not my own invention, I would say next in usefulness to the dental engine is the electric gold annealer.

The electric cautery was a marked improvement over the actual cautery of years ago. A similar instrument may be used as a root dryer. The heat is not only steadily maintained but is under the absolute control of the operator. Instead of approaching the patient with the formidable red-hot iron, the instrument is placed in position, the button touched and the heat maintained or varied at will. By a shunt arrangement, the incandescent current may be used for the cautery and root dryer without injury to the instrument.

Every operator knows the difficulty of throwing a blast from the warm-air syringe without producing pain. It is not sufficiently definite. This difficulty may be overcome by the use of the electric current. Through a coil of German silver wire of a given size; a current at one hundred and ten volts gives heat which may be accurately measured. If this wire is enclosed in a rubber tube and through the tube air is forced at a given pressure it will escape heated to the desired degree. The temperature may be varied at the will of the operator by varying the heat of the coiled wire by a rheostat or by varying the air pressure. The calculations being accurate, by this device it is possible at all times to obtain a blast of air at blood heat which will not be painful.

The electric mallet is a time-saving appliance familiar to all. In many cases the peculiar blow from this instrument is more agreeable than any other form of malleting. The electric light is a valuable aid in diagnosis and many times saves drilling and other forms of exploration.

The appliances just mentioned are practical and useful instruments and are steps toward painless dentistry, but we have just begun the application of electricity in dental practice. I see in the near future an electro-deposition of gold or platinum in the cavity of a tooth which is not only a preventive of recurrent decay itself but is a cohesive foundation to which a gold filling may be attached relieving the walls of much strain. I also see a plating of metal covering the whole crowns of the posterior teeth predisposed to caries or in a less charlatan-like manner it may be restricted to the fissures and proximal positions.

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# Persistent Vitality.

BY F. O. JACOBS, D.D.S.

Read before the Meeting of the California State Dental Association, 1894.

The interest that has lately been created in the operations of replantation, transplantation, etc., has raised the question among dentists as to whether a tissue will survive after having been removed from its natural position and again replaced, or after having been removed, can it again be transplanted to another individual without suffering death? And if so what time may elapse between the two operations? And if it should be determined that such operations were possible what tissues are the most favorable to such operations? Or, in other words, and more briefly, is there such a thing as persistent vitality?

In surgical operations, just as in every other department of science, we are constantly meeting with surprises. What had been classed with the impossible yesterday is the practicable operation of to-day, and we are constantly being driven back to first principles to account for some unexpected results.

This subject involved the broad question, what are the conditions that produce death, and what conditions are required to support life? Can we lay down any law or rules that will hold good in all cases? At first we meet with so many seeming contradictions that we are discouraged in the attempt. We are prone to think that one form of life is something entirely different from another, and the rules that would apply to one will not apply to another. While we find, in general, that living organisms may exist only in an atmosphere or medium containing more or less free oxygen, some one comes along and tells you he knows of certain forms of life that can exist in an atmosphere of carbonic acid, drawing all its oxygen from its food. Another must have a medium of salt water; another must exist in fresh water; others still cannot be immersed in water but for a few moments without suffering death. Some organisms are able to withstand extreme changes of moisture or temperature. Some animal forms and also plants may be deprived entirely of their moisture—completely dried up, so that vital functions are entirely suspended until moisture is again restored. Some may be frozen in cakes of ice or raised to a temperature near the boiling point of water without any other effect than to suspend functional activity for the time being.

Among the more highly-specialized organisms the amputation of a member or organ generally produces death in the parts so treated, or in the entire organism, owing to which organ or part is separated from the body. But in the more simple forms amputation of a part only produces a new animal. A remarkable example of this is found in the fresh water hydra. This animal consists of a tube, one end of which is modified into a foot and the other is furnished with arms. The entire animal is of but one tissue. If an arm is amputated it immediately grows into a new hydra. The animal may be cut into several pieces, with the result of producing as many animals instead of death. One might think it was possessed of remarkable tenacity of life, but these animals are as easily killed as any. Turn the animal inside out, it immediately makes an effort to right itself. Should it fail, it dies. Deprive it of moisture and it dies.

Why should the cutting of an animal to pieces only have the effect of multiplication, and simply depriving it of moisture produce death? Exactly the reverse of some other plants or animals. The explanation is probably this: its structure is that of large, delicate cells, very soft, which are easily broken up by desiccation, so that by depriving it of moisture its structure is destroyed; death is, of course, the result. Cutting it in pieces only multiplies because it is composed of but one tissue throughout, capable of performing the same functions. Hence, a piece, if separated from the balance of the animal, is not dependent upon it to perform any of the functions necessary to support life. Reversing destroys its life, because the cells on the inside of the tube are so modified as to perform the functions of assimilating food; while the outer cells are for the protection of the inner. When the animal is reversed neither of these sets of cells are in a position to perform their natural functions, therefore, death is the result.

Now, there are other plants and animals of which the reverse is true, which if deprived of their moisture simply remain inactive until the proper quantity of moisture is restored when they resume their normal functions. In their case the cell structure is a strong, firm tissue, which is not broken up by desiccation. Depriving the living matter or protoplasm within of its moisture is not a chemical but a physical change. Chemical action, oxidation, etc., goes on extremely slow, if at all, until the proper conditions are again restored for the performance of its natural functions. The living matter within the cells is a chemical compound, the exact chemical nature of which is not known, but its constituent elements are known. It is extremely unstable, being constantly acted upon by free oxygen on the one hand, it must be constantly taking up the proper material on the other to preserve the equilibrium in its chemical nature. Its affinity for water is great and its activity depends upon the presence of water; the more water it is able to absorb, the more active it becomes. In the absence of that element activity ceases until moisture is restored, unless some chemical change takes place, when it is no longer protoplasm. As it does not form compounds with other substances, without losing its identity, differing in the least from itself in chemical nature, a living tissue is never attached to a dead one or to other substances. Hence, when a living tissue is found attached to another, supposed to be a dead one, it must be considered evidence that the tissue supposed to be dead is at least possessed of a low degree of vitality.

What has been said of protoplasm is true of it wherever found, for living matter is the same thing wherever found. The different modes of death cited above are due to the difference in the structure of the tissue it inhabits. Where the tissue is composed of firm, hard cell-walls it is much more able to endure desiccation. Where an organism is composed of a similar tissue throughout its entire body, separating it into pieces only multiplies it.

One of the present methods of skin-grafting, scraping the epithelial cells from the surface of the skin on to the part to be engrafted, is a case where a tissue, or cells of formed tissue, is engrafted on to another tissue, forming a union and a new tissue; transplanting.

Now, if a tissue can be transplanted from one place or location to another, some time must elapse between the two operations. It then becomes a question how long will a tissue endure between the two operations, and what tissues are most favorable to such operations? How long could the scrapings of epithelial cells be preserved before transplanting, or how much time might elapse between the operation of extracting and of transplanting a tooth? The evidence furnished by such operations is conclusive, that it is much greater than any of us have supposed. Bone may be grafted from one animal to another, even chips of bones may be placed into the wound and a new tissue formed around it. (American Text-Book of Surgery.)

Why may not a tooth be successfully transplanted? Its structure is not changed by extracting, and decomposition is less likely to set in than in any other tissue of the body.

The above illustration may seem to be far-fetched, but not so. Much of what we have yet to learn in physiology must be drawn from the study of minute and simple formed organisms. The facts to which I have called your attention will show that death implies a chemical change, and without that there is no death.

It also shows that the tissues that are best suited to transplanting, replanting, etc., are hard, firm and simple structured tissues; like the skin, the teeth and bones. Those less suited for such operations are of delicate cell-walls and soft, loose structure, that will easily collapse when removed from its normal position, and by loss of moisture.

The success that has been met with in transplanting such tissues fully confirms the above conclusion.

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## An Act for the Regulation of the Practice of Dentistry in the State of Michigan.

SECTION I. It shall hereafter be unlawful for any person to practice dentistry in this State unless he shall first have obtained a certificate of enregistration from the Board of Dental Examiners provided for by this Act, and filed the same or a certified copy thereof, with the County Clerk of the County in which he practices, all as hereinafter provided. The provisions of this act shall in no way apply to or affect any person who is now located and lawfully in actual practice in this State.

SEC. II. Said Board of Dental Examiners shall be appointed by the Governor of the State, and shall consist of five practical dentists who shall be regular graduates of a reputable dental college, duly incorporated under the laws of this or some other State of the United States. The members of the first board under the provisions of this Act shall consist of the members of the present Board of Dental Examiners, who shall hold their offices as members of such new board for the term for which they were appointed under said former act, and until their successors are duly appointed. All vacancies in said board shall be filled by appointment by the governor as hereinafter provided.

The term for which members of said board shall be appointed shall be three years and until their successors shall be duly appointed. It is also hereby provided that no person shall serve to exceed two terms in succession.

SEC. III. The Board of Examiners at its first regular meeting, annually, shall choose a President, a Secretary and a Treasurer from its members who severally shall have the power during their term of office to administer oaths and take affidavits, certifying thereto under their hands and seal of the said board, and to receive, disburse and take care of all moneys which come into the hands of the board.

SEC. IV. The Board of Examiners shall meet semi-annually for the purpose of examining applicants, after having given notice in the papers throughout the State for four weeks prior to each examination. The said board is authorized to incur all necessary expenses in the prompt and efficient discharge of its duties, and pay the same with any money in the hands of its treasurer. A majority of said board shall all times constitute a quorum. It is furthermore provided that in the event of any member of said board absenting himself from two of its regular meetings consecutively, the board may declare a vacancy to exist, which vacancy shall be filled by the means hereinbefore provided.

SEC. V. It shall be the duty of the first board, hereinbefore provided for, to meet and elect officers at its first meeting, and within ten days thereafter to transfer to a register to be provided by them for that purpose, the name, residence and place of business of each and every person who, pursuant to an Act of the Legislature of the State of Michigan, (approved May 26th, 1891), shall be duly registered on the books of the board created by said act of May 26th, 1891. No certificates of license to practice dentistry shall be issued after the date the board transfers names, etc. It shall be the duty of the said secretary of the first board hereby created to send to each person so registered, prior to the date the law takes effect, a certificate of his enregistration, signed and certified thereto by the president and secretary, under their hands and seal of said board.

SEC. VI. Any person or persons who shall desire to begin the practice of dentistry in the State of Michigan on and after the date the law takes effect, shall file their names together with an application for examination with the Secretary of the State Board of Dental Examiners, and at the time of making such applications shall pay to the treasurer of said board a fee of ten dollars ($10.00) and shall present themselves at the first regular meeting thereafter of said board to undergo examination before that body. The examination shall be elementary and practical in character but sufficiently thorough to test the fitness of the candidates to practice dentistry. It shall include, written in the English language, questions on the following subjects: Anatomy, Physiology, Chemistry, Materia Medica, Therapeutics, Metallurgy, Histology, Pathology, Operative and Surgical Dentistry, Mechanical Dentistry, Bacteriology, Oral Surgery and also demonstrations of their skill in Operative and Mechanical Dentistry. All persons successfully passing such examinations shall be registered as licensed dentists in the board register provided for in Sec. V., and also receive a certificate of such enregistration, said certificate to be signed and certified thereto by the president and secretary under their hands and seal of said board.

SEC. VII. Recipients of said certificate of enregistration shall present the same for record to the county clerk of the county in which they are to practice dentistry. Said clerk shall record said certificate in a book to be provided by him for that purpose and shall be paid a fee of twenty-five cents for registration of the same. A person so licensed, wishing to practice in another county, must obtain from the county clerk in which said certificate of registration is recorded a certified copy of such record, or else obtain a new certificate of enregistration from the Board of Examiners, and shall, before practicing in such county, file the same for record with the clerk of that county to which he removes and pay the clerk for recording the same a fee of twenty-five cents. Said board and clerk shall be entitled to a fee of fifty cents for the re-issue of any certificate, or making and certifying to a copy of the record of any such certificate. Any failure, neglect or refusal on the part of any person holding such certificate or copy of record to file the same for record as hereinbefore provided for six months from the issuance thereof shall forfeit the same.

SEC. VIII. All persons shall be said to be practicing dentistry within the meaning of this act who shall for fee or salary or other rewards paid either to themselves or to another person for operations or parts of operations of any kind, treat diseases or lesions of the human teeth or jaws, or correct mal-positions thereof; but nothing in this act contained shall be taken to apply to acts of bona fide students of dentistry done in pursuit of clinical advantages under the direct supervision of a preceptor or a licensed dentist in this State, or during the period of their enrollment in a dental college and furthermore, it shall be prima facie evidence of the practice of dentistry, if any person or persons advertise themselves as dentists or hold themselves out for the practice of dentistry in any manner whatsoever by sign or otherwise, provided their certificate is not recorded as hereinbefore provided.

SEC. IX. Any person who shall practice dentistry in this State in violation of the provision of this Act, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined not less than five ($5.00) dollars, nor more than one hundred ($100.00) dollars, or sentenced to imprisonment in the county jail for a period not exceeding ninety (90) days or both; such fine and imprisonment is in the discretion of the Court; provided that nothing in this Act shall be construed so as to interfere with physicians and surgeons in their practice as such.

SEC. X. Out of the funds coming into possession of the board the members of said board shall receive as compensation the sum of three ($3.00) dollars for each day actually engaged in the duties of their office, and mileage at the rate of three (3c.) cents per mile for all distance necessarily traveled in going to and coming from meetings of the board. Said expenses shall be paid from fees and assessments received by the board under the provision of this Act, and no part of the salary or other expenses of the board shall ever be paid out of the State treasury. Any sum in excess of one hundred ($100.00) dollars which shall under the provisions of this Act accumulate in the treasury of said board, shall be paid by the treasurer thereof into the State treasury.

SEC. XI. Any person who shall knowingly or falsely claim or pretend to have or hold a certificate of enregistration, diploma or degree granted by a society or by said board, or who shall falsely and with the intent to deceive the public, claim or pretend to be a graduate from any incorporated dental college, not being such graduate, shall be deemed guilty of a misdemeanor and shall be liable to the penalties provided in Sec. IX of this Act.

SEC. XII. Any person who shall be licensed under the provisions of this Act and who shall practice dentistry under a false name, with intent to deceive the public, shall be liable to have said license revoked upon twenty days' notice of such proposed revocations and of the time and place of considering such revocations, by order of the State Board of Dental Examiners. And any person who after revocation of their license shall continue to practice dentistry in the State of Michigan shall be deemed guilty of the violation of the provisions of this Act, and shall be subject to the penalties provided therein. Nor shall a certificate to a person under one name be any defense to an action brought against them for practicing without a certificate under another.

SEC. XIII. It shall be the duty of the respective County Prosecuting Attorneys to prosecute all violations of this Act. In case of the failure of the prosecutor to act, it shall be the duty of the Court to appoint an Attorney to conduct such prosecutions.

SEC. XIV. The Board of Dental Examiners created by this Act may sue or be sued, and it shall be made a party under the name of the Board of Dental Examiners of the State of Michigan in all actions brought by or against it.

SEC. XV. This Act shall take effect and be in force from and after its passage.

MANNING A. BIRGE, Chairman.
J. WARD HOUSE,
BEN. H. LEE,
*Committee of Grand Rapids Dental Society.*

# SELECTIONS.

## Indications for Cocaine in Surgical Operations.

Prof. A. Ceci (*Gazzetta Degli Ospitali*, No. 29, 1894), has employed cocaine in 484 operations since 1885, using it in cases where general anæsthesia is usually practiced—for example, in eight operations for extirpation of goitre, in two extirpations of the mammary gland with cleaning out of the axilla, thirty-four radical operations for hernia, two vaginal hysterectomies with removal of the uterine appendages, one laparotomy, four amputations of the tongue, two of which were preceded by preliminary ligation of the linguals, with cleaning out of the submaxillary region. First he employed such strong solutions as five to ten per cent.; later he only used from a one to one-half per cent. solution, which latter he now exclusively employs. The solutions must be recent and contain two and one-half per cent. of boric acid. In adults he gives a preliminary injection of morphine, so that the anæsthesia is mixed (morphio-cocaine). During the first two years he only observed two cases of intolerance of the drug, which were due to too strong solutions being used. The fluid should be well scattered throughout the tissues, and care be taken that it is not injected into a vein. He denies that cocaine predisposes to suppuration of the part; this is dependent either upon lack of antisepsis, pollution of the solution, or a dirty syringe. During the past year he was able to reduce the number of chloroformizations in his clinic to twenty-three, while the year before they amounted to seventy. He finds cocaine of especial value in operations on the neck, in extirpations of goitres and lymphatic glands, and in radical operations for hernia. Contrary to the opinions generally expressed he has found that cocaine anæsthesia may last over an hour without repetition of the injection. *The Cincinnati Lancet Clinic.*

## Successful Removal of a Denture from the Œsophagus.

An extremely interesting account of the successful removal of a denture from the œsophagus is recorded in a recent number of the *Transactions of the Odonto-Chirurgical Society of Scotland.* The patient in question was a married woman, 28 years of age, and the teeth were swallowed during sleep, on the night of July 31, 1893. At the time of the accident she complained of considerable pain, and consulted a medical man, who ordered her removal to the Royal Infirmary, Edinburgh. On the following morning, when seen by Mr. David Wallace, she complained of slight pain opposite the manubrium sterni; she was able to swallow milk, but the act of deglutition gave rise to pain. With some difficulty the presence and situation of the foreign body was diagnosed, the exact position being gauged as "midway between the manubrium sterni and stomach." Œsophagotomy was performed, the opening into the gullet being made as low down as possible; dressing forceps were introduced and an attempt made, but without success, to grasp the plate. Laparotomy was then performed, the incision being in the median line between the xiphi-sternum and the umbilicus. Precautions were taken to prevent the passage of foreign matter into the general peritoneal cavity, and the stomach opened by an incision at right angles to the greater curvature, sufficiently long to admit the forefinger; but as some difficulty was encountered in finding the œsophageal opening, the incision was extended so as to admit the whole hand. The plate was found to be situated about one inch and a-half from the œsophageal opening, and was easily removed with suitable forceps and the wound dressed. *Journal of the British Dental Association.*

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## A Curious Case.

The history of an interesting and unique case of suppuration in connection with the lower jaw is recorded in the April issue of the *Dental Record*, by Mr. F. Rooke. A patient, aged 19, was admitted into hospital for a well-marked swelling extending over the right side of the cheek and neck. This condition was attended with a good deal of trismus, the temperature being 103° F. Fluctuation was distinct, and the parts extremely painful. Under an anæsthetic an examination of the mouth was made, and two carious molars on the right side removed, this operation being followed by a profuse discharge of offensive pus. Two days subsequently the temperature had fallen to 99° F; the swelling had greatly subsided, but a good deal of pain still existed, while an opening on the cheek appeared inevitable. This abscess was at the end of eight days opened, with a result that the pain felt considerably easier; the suppuration still continued to spread forwards and showed signs of pointing again midway between the angle and symphysis. In the act of irrigating the original sinus and squeezing out the pus, a *melon seed* made its appearance, and from this point the symptoms took a favorable turn, the patient making a speedy recovery. *Journal of the British Dental Association.*

## Obtundent for Sensitive Dentine.

| | | |
|---|---|---|
| R. | Cocaine hydrochlor | 5 grains |
| | Chloroformi | ½ drachm |
| | Acid. hydrochlor | 10 minims |
| | Alcohol | ½ drachm |

Mix.

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GLYCERINE, four parts, to bismuth, one part, is the best way to keep the latter in solution.

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AMYL NITRITE is a physiological antidote to cocaine, and should always be at hand when making applications of the latter.

## What Caused Death.

I have a case I wish to report in the *Brief*, hoping to get some light on it.

Mrs. C., aged twenty-five years, married and the mother of four children. On May 14th and 15th she worked in her garden, became over-heated, and after getting cool, began complaining of toothache. Jaw began to swell with sore throat. On Sunday following I was called to see her. Found her with all the symptoms of a severe case of tonsilitis. My treatment was in accordance with this diagnosis, but produced no effect. Fearing tracheotomy would have to be performed, consultation was called. Diagnosis was concurred in, but no operation was done. Patient seemed to improve a little as far as breathing was concerned, and would get so she could swallow a little every day. The swelling and pain increased, the latter being very severe, blood was drawn from the swelling to give relief which would only last a few minutes. On Thursday patient became a little delirious, for, a short while afterward, as I was passing her bed, she exclaimed: "Doctor, do you love Jesus?" and began shouting and praising God; called all her friends and children up to her and said: "I must die and leave you all." After quieting her as best I could, she began to sweat profusely, and the heart's action increased. This continued for twenty-four hours when death closed the scene. Was it blood poisoning, or what was it? She did not die from asphyxia.

I hope to have the opinion of the editor and some of the older practitioners. J. D. HOPPER, M.D.

# COMMENCEMENTS.

## University of Minnesota—Dental Department.

The annual commencement exercises of the Dental Department of the University of Minnesota were held, in connection with those of the other departments of the University, at Minneapolis, Minn., June 7th, 1894.

The degree of D. M. D. (Doctor of Dental Medicine) was conferred on the following graduates:

| NAME. | RESIDENCE. | NAME. | RESIDENCE. |
|---|---|---|---|
| John Paul Handy | Long Prairie. | Alfred Owre | Minneapolis. |
| Martin Franklin Lowe | Fairmont. | James Martin Walls | St. Paul. |
| Frank Herman Mero | Minneapolis. | Arthur Deming Whiting | Northfield. |

Total, 6.

## Chicago College of Dental Surgery.

The twelfth annual commencement exercises of the Chicago College of Dental Surgery (Dental Department of Lake Forest University) were held in the Columbia Theater, Chicago, Ills., on Monday, April 30th, 1894, at 2 P. M.

The number of matriculates for the session was three hundred and sixty.

The address to the graduates was delivered by John M. Coulter, Ph. D., LL. D., President of the University, and the valedictory by Geo. H. Denison.

The degree of D. D. S. was conferred on the following graduates by Truman W. Brophy, M. D., D. D. S., Dean of the Faculty:

| NAME. | RESIDENCE. |
|---|---|
| Frank H. Baker | Illinois |
| Carl O. Bauth | Illinois |
| Fred. H. Burkhardt | Illinois |
| John R. Brown | Illinois |
| Herbert B. Cole | Michigan |
| Edward H. Czolbe | Illinois |
| Arthur P. Davis | Wisconsin |
| Geo. H. Denison | Indiana |
| Arnold E. Dick | Hungary |
| Orlan T. Eddy | Illinois |
| Walter W. Eberhart | Minnesota |
| Geo. H. Edgerton | Illinois |
| Eno L. Fickensher | Illinois |
| William C. Gowan | Canada |
| Robt. C. Gebhardt | Wisconsin |
| Joseph E. Grattelo | Illinois |
| Geo. W. Harris | Minnesota |
| Frank R. Houston | Wisconsin |
| Alfred L. Haas | Iowa |
| David A. Hare | Canada |
| Ralph W. Harold | N. Dakota |
| Albert M. Harrison | Illinois |
| Fred. J. R. Hemple | Michigan |
| Edward H. Hickman | Illinois |
| Chas. W. James | Illinois |
| John W. Johnson | Canada |
| John K. Kane | Illinois |
| Carl R. Kuderling | N. Dakota |
| Geo. R. Lee | Illinois |
| B. J. La Grange, M. D | California |
| Samuel E. Leece | Wisconsin |
| Elsie H. Leib | Illinois |
| Chas. C. Mann | Washington |
| Alex. O. McBean | Wisconsin |
| Arthur D. O'Neill, Jr | Illinois |
| John E. Pollock | Illinois |
| Milton B. Pine | Indiana |
| Ceylon Rossman | Minnesota |
| Jasper M. Revel | Canada |
| Ruger C. Stevenson | Wisconsin |
| Frederick B. Skillman | Illinois |
| William F. Saunders | Wisconsin |
| Chester G. Stinson | California |
| Thomas Sheridan | Illinois |
| Floyd Sykes | Wisconsin |
| Frank Smith | Illinois |
| Alfred B. Sargent | Minnesota |
| Chas. L. Thomas | California |
| Lewis P. Voss | Illinois |
| George W. Winslow | Indiana |
| Chas. G. R. Wright | Illinois |
| John J. Wright | Wisconsin |
| Joseph S. Wright | Mississippi |
| Henry L. Whipple | Illinois |
| Simon F. Wilhelmi | Illinois |
| Thompson P. Wheat | Illinois |
| Chas. M. Wesner | Illinois |
| Charles H. Wylie | Wisconsin |

Total 58.

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## Northwestern University Dental School.

The annual commencement exercises of the Northwestern University Dental School were held at the Central Music Hall, Chicago, Ill., on Tuesday, April 24, 1894.

The number of matriculates for the session was ninety-five.

The degree of D.D.S. was conferred on the following graduates:

NAME.

Lucian H. Arnold
William Spencer Bagley
Samuel Augustus Beel
Edwin Kenton Bennington
Leander Read Brown
Louis Arthur Edwards
Charles Herbert Eldred
Benjamin Franklin Ells
Frederick Wilhelm Fritsche
Robert Leslie Hopkins
Philip Freeman Kittoe
Louis Ladewick

NAME.

William Lansing Lewis
Charles Casper Lipe
Fred. William Marriett
Paul George Maxon
Abraham Louis Oberndorf
Caspar Paul Pfaff
Hosea Edwin Reid
Aurin Ralph Shaw
Edwin Henry Smith
Charles Mackay Smith
Claude Bryant Warner
Herbert Devere Wilson

Total, 24.

## University of Buffalo—Dental Department.

The second annual commencement exercises of the Dental Department of the University of Buffalo were held, in connection with those of the Medical and Pharmaceutical Departments, in Music Hall, Buffalo, N. Y., Tuesday evening, May 1, 1894.

The number of matriculates for the session was eighty-six.

The examinations before the Board of Curators, comprising the State Dental Examining Board, were held during the day, and at the close the following candidates for graduation were recommended to the Chancellor of the University for the degree of Doctor of Dental Surgery, which was accordingly conferred upon them:

NAME.

Arthur G. Bullock
Joseph W. Beach
Seymour E. MacDougall

NAME.

Joseph L. Povall
Frank L. Sibley
William H. Snider

Total, 6.

## University of California—College of Dentistry.

The annual commencement exercises of the College of Dentistry of the University of California were held at Odd Fellows' Hall, San Francisco, Cal., Thursday evening, June 14, at eight o'clock.

The address on behalf of the Faculty was delivered by Joseph D. Hodgen, D.D.S., '87.

The degree of D.D.S. was conferred on the following graduates by Martin Kellogg, A.M., LL.D., President of the University:

NAME.

Edward Ellsworth Baird,
William Henry Cavill,
McCoy Chappell,
Conrad Deichmiller,
John Alvin Gibbon,
Gilbert Fuller Graham,
Robert Frederick Gray,
Walter Simpson Jewell,
James William Likens,

NAME.

William O'Rourke,
Henry Powell, jr.,
William Judson Taylor,
Leander Van Orden, jr., M.D.,
Thomas Augustus Vogel,
David John Vogelman,
William Henry Wadsworth,
Walter Irving Wilcox,
Charles Calvin Wood.

Total, 18.

## Harvard University—Dental Department.

The annual commencement exercises of the Harvard Dental School were held, in connection with those of the other schools of the University, in Sanders Hall, Cambridge, Mass., on Wednesday, June 27th, 1894.

The number of matriculates for the session was sixty-three.

The degree of D.D.S. was conferred upon the following graduates by the President of the University, Charles William Eliot, LL.D.:

NAME.

Eugene Everett Arnold,
Joseph Bergin Belliveau,
Joseph Boylston,
Jay Reuben Holton,
Joseph Inderbitzen,
Arthur Jackson,
Frederick William Percival,

NAME.

Thomas Edward Quinn,
Fred. Gibson Robbins,
Arthur Galusha Smith,
George Lund Taft,
Louis Napoleon Veo,
William Joseph Walton.

Total, 13.

# NOTICES.

## The American Dental Society of Europe.

Notice has already been given in the July number of the Dental Register, of the nineteenth meeting of the American Dental Society of Europe, which is to be held in the *Athenee*, Geneva, Switzerland, August 6th, 7th and 8th inclusive.

The following list of papers to be read and discussed has been prepared, viz.: "A Few More Words on Pyorrhœa," by Dr. A. V. Elliott, of Florence; "Theory of the Crystal Mat

Gold," by Dr. De Trey, of Basle; "The Etiology of Defective Enamel," by Dr. Waldo E. Royce, of Tunbridge-Wells; "On the Treatment of Bicuspids," by Dr. Chas. W. Jenkins, of Zurich; "The Law of Statistics in Hard and Soft Dental Tissues Demonstrated by Anatomical and Microscopical Specimens, Drawings and Models," by Prof. August Eternod, of Geneva; "Copper Amalgam, Our Last and Most Unholy Transgression," by Dr. L. C. Bryan.

There will be a paper by Prof. W. D. Miller, of Berlin, and one by Prof. F. Vulliet.

### CLINICS AND DEMONSTRATIONS.

"A Practical Method of Contouring Some Teeth with Gold," by Dr. H. L. Schaffner, of Florence; "Application of a New Set of Pluggers to the New Combined Sponge Mat Golds," by Dr. E. De Trey, of Basle; "The Basle Electric Engine Motor with Accumulators and Instantaneous Stop, Etc.," by Dr. Bryan, of Basle; "A Method of Fixing an Artificial Lower Incisor in Place of a Natural One Lost through Pyorrhœa," by Dr. Elliott, of Florence; "Demonstration of Cohesive and Non-Cohesive Gold Combined in Filling," by Dr. E. J. Wetzel., Mulhausen.

Dr. Luce, of Stuttgart, and Dr. Terry, of Milan, have kindly promised to furnish something of interest to the profession.

The Executive Committee have arranged for only two days of professional work, the other day to be spent in social recreation.

It will, without doubt, be a most enjoyable time for those who attend the meeting.

Dr. Lyman C. Bryan, President, Basle.
Dr. Chas. W. Jenkins, Secretary, Zurich.

## Alumni Reunion.

There will be a reunion of the Alumni of the Dental Department of the University of Michigan at the time of the meeting of the American Dental Association, at Old Point Comfort, August 7th, 1894.

Come, let us renew old acquaintances and keep alive the interests of our Alma Mater.

U. D. BILLMEYER, Sec'y, Chattanooga, Tenn.
M. F. FINLEY, Pres't, Washington, D. C.

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## Connecticut State Dental Association.

The Connecticut State Dental Association holds its next regular meeting in Hartford, the Third Tuesday in May, 1895. There will probably be a special meeeting December 11th, to celebrate the Semi-Centennial of the discovery of anæsthesia, by Horace Wells, a Hartford dentist.

The following officers were elected for the ensuing year: President, Dr. Charles P. Graham, Middletown; Vice-President, C. W. Strang, D.D.S., Bridgeport; Secretary, George L. Parmele, M.D.,D.M.D. Hartford; Treasurer, Daniel A. Jones, M.D. D.M.D., New Haven; Ass't Secretary, Charles McManus, D.D.S. Hartford. Executive Committee: Charles McManus, D.D.S., Chairman; Wm. H. Rider, M.D.S., Danbury; Dr. C. C. Barker Meriden.

G. L. PARMELE Secretary.

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## OBITUARY.

DIED, July 26th at his home in Baltimore, Md., after a protracted nervous affection, a result of the grip, Dr. R. B. Winder.

Dr. Winder has been for many years connected with the Baltimore Dental College and has been for most of the time its dean. He was a man of energy and more than ordinary ability, and had a commanding influence in the dental profession.

The loss of such a man makes a void that is not easily filled.

THE DENTAL REGISTER.

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# PROCEEDINGS.

## Alabama Dental Association.

Reported for the DENTAL REGISTER by Mrs. J. M. Walker.

The twenty-fifth annual meeting of the Alabama Dental Association was held in Montgomery, April 10 to 13, 1894.

OFFICERS: Dr. T. M. Allen, Birmingham, President; Dr. R. A. Rush, Selma, First Vice-President; Dr. W. E. Proctor, Sheffield, Second Vice-President; Dr. G. M. Rousseau, Montgomery, Treasurer; Dr. S. W. Foster, Decatur, Secretary.

After prayer by the Rev. Mr. Davis a cordial welcome was tendered the members of the association, to which graceful response was made by Dr. Chas. A. Merrill.

The president then delivered his annual address. He addressed himself especially to the younger members of the association, urging upon them the importance of continuous labor and study if they would achieve the professional rewards of honor and distinction. As appropriate to the quarter-centennial of the association the president embodied much statistical and historical matter in his address. He pointed out the fact that of the founders of the association but four survive. Two of these, Dr. H. D. Boyd and Dr. H. Locke, are still active members. Dr. Allen also reviewed the history of dental legislation in Alabama, and the work of the State Board of Dental Examiners. He urged upon the association the appointment of a committee to secure such legislation as would prevent the indiscriminate extraction of teeth by street fakirs, Indian doctors, etc. This portion of the address was discussed at some length by the association. Dr. Allen called attention to the injurious effects of the nostrums used by these irresponsible individuals to secure so-called "painless extraction" resulting in swelled faces, sloughing, necrosis and other serious injuries. Within three weeks after a visitation of one of these peripatetic tooth-pullers he had had seven cases of necrosis to attend to. He said, this is not a matter of dollars and cents, but of irreparable injury to the people who, in their ignorance, patronize these charlatans.

Dr. W. H. Morgan, Nashville, Tenn., said this state of affairs was a disgrace to the dental profession; this class of men brings dishonor upon an honorable profession. Their brass bands and gilded chariots and especially their low prices are irresistible to the lower classes by whom they are classed as veritable *dentists*, and the injury they do is reflected back upon the dental profession. It is an outrageous practice—an inhuman butchery—which should not be tolerated by law. He had seen several cases in which the local injections had caused induration of the tissues, a slow, cold, inflammatory action of which the final result cannot be prognosticated. Many well-meaning dentists, anxious to relieve their patients from the pain attendant upon tooth-extraction, buy and use these patented nostrums of which the formula is kept secret, using them without evil intentions, but, nevertheless, in violation of the code of ethics. Every provision of the code is justified and should be obeyed. It is the duty of the dental profession to look after this thing and have it prohibited.

The president in his address also urged that a representative from the State Board of Dental Examiners be sent to the meeting of the National Board.

Dr. J. Y. Crawford, Nashville, Tenn., hoped that this would be done. He said that the two National Associations of College Faculties and Examiners, working together in harmony, had done very much toward elevating the dental profession. He said that it is very desirable to bring about harmony and unity of action between the different State Boards and to secure unification of the State Dental Laws, or trouble would arise from efforts to have those laws repealed. Before laws are enacted or amendments asked for, the questions should be asked—is it just? is it wise? does it seek to protect the few, or is it for the benefit of the whole people? All such laws should be placed on the statute books in terms of the plainest statement of fact. In trying to draw up laws to meet every possible emergency it gets to be so complicated that neither the people nor the officials can determine the meaning. Our own State law has no provision interfering with this promiscuous extraction of teeth, because we feel that in making a start we could not ask for everything; but it is not right. It brings about a condition of things necessitating eventually an expenditure of hundreds of dollars in remedying the evils done in saving on the cost of legitimate tooth-extraction. The laws must be so amended as to punish this indiscriminate extraction by irresponsible persons. (A voice, "You won't get the amendment.") In saying we won't get it, you do more to hinder it than anything else. If we get the unanimous consent of the State Societies and of the State Boards—if every dentist says *it must be,* if no one pulls back but all push forward, in less than five years we will have it on the statute books. Talk to your intelligent legislator and show him that he would be derelict to his duty if he fails to support such a measure. Any man who cannot be made to see his moral duty in such a case had better be retired to private life. In union there is strength, and I have sufficient confidence in the love of right and the moral integrity of our legislators to say *it will be done.*

At the close of the discussion a committee was appointed to secure the enactment of a law prohibiting the extraction of teeth "for pay or reward" except by those who have been before the Board of Examiners and obtained license.

On motion of Dr. S. W. Foster, Dr. T. P. Hinman, Atlanta, Ga., was elected an honorary member of the association, and was invited to describe his method of securing a perfect adaptation of the Logan crown to the abutment of the natural root, as follows: The root having been properly prepared and trimmed, a small piece of paraffine is molded around the pin, close up to the porcelain. A small disk of No. 60 tin-foil or platinum is then cut, a little longer than the abutment of the root, and threaded on the pin close up in the wax. The crown is then placed on the root, the pin having been bent, if necessary, to secure alignment, and forced closely into place, the wax driving the foil disk into perfect apposition with the abutment of the root, of which it receives a perfect imprint. Removing carefully the crown, the wax and foil in position, with a warm blade, all the excess of wax beyond the circumference of the root is trimmed away and the projecting margins of the disk snipped with sharp, fine-pointed scissors, at intervals to the imprint of the abutment. A small pellet of wax is then placed on the point of the pin, and the whole invested, point down, in quick-setting plaster just up to the porcelain. When the plaster has set, remove the crown, the snipped edges of the disk securing the latter in the plaster, leaving a perfect metallic-surface model of the abutment of the root, exposing to view every surface in all its diameters. The crown being cleaned of the wax is then ground to the root expeditiously and accurately, the pellet of wax which was placed on the end of the root allowing space for the pin to penetrate deeper in the plaster model of the root, as the porcelain is ground away. This method will be found applicable to all of the teeth for which Logan crowns can be used, and for all porcelain crowns which have platina pins baked in them.

Dr. Merril expressed the thanks of the association for this eminently practical method of overcoming what sometimes proves to be a great obstacle in the use of the Logan crown, and gives an added value to this invaluable crown.

Dr. T. M. Allen said that he had tried this method and found it practical and valuable.

Dr. J. Y. Crawford said that this one item was sufficient to repay him for his time and trouble in coming from Nashville to Montgomery.

Dr. J. D. Adair described the method of using the kalium natrium (potassium-sodium) preparation of Dr. Emil Schrier, and reported very satisfactory results in a number of cases. In one case he had vainly treated for six or eight weeks abscesses of three superior incisors, which were to receive Logan crowns. As the young lady had to return to her home in Baltimore, he concluded to make an application of the preparation and fill the roots without further delay. There was still pericemental tenderness with pus constantly present. The Logan crowns were put on immediately after one treatment with Dr. Schrier's preparation, and the young lady left town the next day. He awaited the result with considerable apprehension but was gratified to learn that the treatment was perfectly satisfactory. Ten months have elapsed since the crowns were put on, and the roots have given no trouble.

Methods of obtunding sensitive dentine were discussed at some length, especially of teeth that are to be shaped for crowning where the operation cannot be completed at the first sitting.

Dr. T. M. Allen finds ammonia and hot burnishers of great assistance.

Dr. Chas. A. Merril uses the old stand-by, chloride of zinc. He uses it when merely deliqusced, getting the escharotic action constringing the contents of the tubuli. When a layer of dentine is removed another application may be made, and so on until all the desired cutting is effected. It may give some pain, but less than by other methods. A gutta-percha cap molded over the tooth will keep it comfortable until the next sitting.

Dr. W. G. Browne, Atlanta, Ga., uses opiates, getting the patient into such a condition that he is both willing and able to bear the necessary pain.

Dr. S. W. Foster places in contact with the dentine a pledget of moistened cotton on which he has taken up some crystals of nitrate of silver, holding it in contact with the tooth by means of a gutta-percha cap molded over the tooth.

Dr. C. L. Boyd uses nitrate of silver.

Dr. H. D. Boyd finds the value of nitrate of silver greatly enhanced by moistening it with alcohol instead of water.

Dr. Watson, finding every other application fail, applied arsenic to the sensitive dentine, expecting to have to remove a dead pulp later on. The patient did not return for more than a year and then reported everything satisfactory. Feeling satisfied that the nerve must have died from the arsenical application he removed the filling but found the dentine so sensitive that the patient could not allow of any excavating. He therefore refilled the cavity, and after eight years' service it is still all right. If it is dead it shows no signs of death.

Dr. W. G. Browne described an interesting case in orthodontia; interesting because of the conditions, the method of treatment and the results. In this case the upper front teeth projected so far that they closed over the lower lip, the teeth being very long and very thin; the lower front teeth struck the soft tissues at the palatine surface of the upper incisors. The chin was very receding, forming almost a straight line from the mouth to the neck. After careful study of the case he decided that the deformity was due—not to protrusion of the upper jaw but to lack of development in the latter. He placed in the mouth a plate covering the roof, so formed as to allow the lower incisors to strike on an inclined plane, and to hold the very short molars apart one-fourth of an inch. The day the plate was put in the family went to New York and he did not see the patient again for six months. When he next saw her he first had a view of her side face and could scarcely believe it was the same child, so great was the improvement. The chin had elongated till the face was perfectly symmetrical. On examination of the mouth he found the "bite jumped" one whole tooth; the molars had elongated till they were in contact and the lower incisors passed up only one-half the length of upper incisors—all of the teeth and the mouth being now in normal condition; all effected in six months, without any attention, simply by wearing the plate described. It had made a wonderful and radical change. The patient is now fifteen years old and a very pretty girl. In reply to a question, Dr. Browne stated that he did not obtain the history of the deciduous teeth or whether they had been prematurely extracted. Several members of the family had abnormal dental developments—varying peculiarities. An uncle had an exceedingly projecting under jaw with very short molars, the inferior incisors closing up outside of the upper teeth.

Dr. C. L. Boyd said it was the imperative duty of every dentist to instruct patients in regard to the importance of the sixth-year molars, not allowing them to be lost under the mistaken idea that they will be replaced ; they should be taught how much depends upon them for comfort, regularity of the teeth and symmetry of the face.

**Dr. Orr** showed a rubber plate made very thin by the "Morris" patented method and strengthened by a band of gold vulcanized in the plate. To this band were soldered (before vulcanizing) bits of gold plate between the teeth, which being trimmed to proper shape and burnished to the tooth gave the appearance of the gold fillings which patients sometimes desire in artificial teeth—a much easier method than drilling cavities in porcelain teeth.

**Dr. Chas. A. Merrill** obtains the same effect by cutting a little channel in the mesial or distil aspect of the tooth with a diamond disk, which he fills with plaster. After vulcanizing he removes the plaster, drills a retaining pit in the vulcanite and fills the cavities in the teeth. This is very easily done, as there is no risk of moisture or *sensitive dentine.*

**Dr. J. A. Frazier** explained his method of "taking the bite" where the patient protrudes the chin, as is so often the case. After the wax is in the mouth, he places one hand on the back of the head and the other over the chin, exerting a strong pressure at the moment the mouth is ordered closed.

**Dr. J. E. Frazier**, in difficult cases, stands behind the patient and places the thumbs in the sigmoid notch.

**Dr. W. H. Morgan**, Nashville, Tenn., said there was no method of taking the impression for an articulating model that is of universal application. The ligaments which control the condyle are very lax in some cases, and strongly elastic in others. Some can draw the jaw much farther back into the glenoid cavity than others. With some patients it is almost impossible to get them to relax the masseter muscles.

A very good method with some is to direct the patient to throw the head back and swallow at the moment of biting into the wax. With some it is impossible, with all your efforts, to get anything but a "jimber-jawed" bite, and after the teeth are waxed up, you have to rearrange them to fit the mouth.

Dr. Merrill spoke of the importance of correct nomenclature in discussing prosthetics. He said: We talk about impressions and molds and models and patterns and casts in a very confused and confusing manner. The proper nomenclature of the process of constructing an artificial denture is first the impression taken from the mouth; then the cast obtained by pouring plaster into the impression; then the model built in wax on the cast; then the mold left after removing the wax, into which is pressed or poured the material of which the plate is constructed.

Dr. A. A. Pearson related an amusing case showing the importance of being careful in the terms we use with our patients. He was making plates for an old lady who was very difficult to please. She objected to having the teeth tried in on the wax base plate, which he unfortunately broke in removing from her mouth, necessitating a second impression. He could only persuade her to have another one taken by assuring her that the first one was only "*temporary*" and that he must take a "*permanent impression.*" Misfortunes never come singly, however, and after completing the plate he dropped it, stepped on it, and all his labor was lost. The old lady refused to have another impression taken, and left in very ill humor to go somewhere else.

The second dentist considered himself very fortunate, with such a patient, in getting everything correct from the first impression, but when he put in the finished plate, she absolutely refused to accept a plate made from "*a temporary impression,*" saying she knew more about dentistry than to allow that sort of work to be done for her!

So she went back to the first dentist who, though he might want a third impression, did not attempt to palm off a temporary impression on her!

Dr. O. C. Farish read a paper entitled "Physiological Chemistry and Therapeutics." In this paper he reviewed briefly some of the universal phenomena of physiological chemistry, as the absorption of new material and the throwing off of effete matter; the incessant removal of organized material; the direct relation between the quantity of material consumed and the active manifestations of life; the material conditions necessary to life, as the consumption of oxygen and the discharge of carbonic acid; the presence and absorption of moisture; the definite limits of temperature; the specific proportions of certain chemical ingredients and the parts taken by them in the act of nutrition, in giving special character to the different organic tissues and fluids of the body; the way in which they are supplied and the changes which they undergo within the body; the phenomena of endosmosis and exosmosis, and the function of chloride of sodium in this wonderful process, and many other interesting points.

Passing on to special therapeutics, the writer dwelt especially on the importance of noting the pathological conditions, not only of the mouth, but of the system generally, and the necessity in many cases of systemic treatment before local treatment can become available or of any benefit. In treating pathological conditions he urged the prime importance of first ascertaining and then of removing the causes of irritation.

This last point was made the special feature of the discussion which followed the reading of the paper.

DR. W. H. MORGAN said all cures depended on the removal of the cause or causes of disease—first ascertain, then remove the cause. In oral diseases, however, it is difficult to ascertain the cause; especially is the cause of caries obscure, and even when we can detect it we cannot remove it. We do not treat abscesses; we simply remove the cause—nature does the rest.

DR. J. Y. CRAWFORD, Nashville, Tenn., (honorary member) dwelt at some length on the importance of treating from a constitutional and systemic standpoint. He said: We are not doing our whole duty when we assume to treat and manage as a specific affection that local form of disease known as dental caries; it is a pathological factor of systemic origin and from local surroundings and environment. Away, back of, and antedating present conditions, are etiological factors found in the organism. There is hereditary transmission of caries from father to child—a physical dyscrasia, susceptibility, is present in marked degree. What is the most common cause of secondary or recurrent decay around fillings? There are etiological factors that cause failures of fillings from the hands even of master operators. There are conditions of pericementitis due to physical dyscrasia that you may treat *locally* for days and weeks in vain, till you resort to constitutional therapeutic treatment. In pulpitis the nervous system is involved; constitutional conditions aggravate it. You must control the heart's action; anodynes alone are of no service; the pulpitis remains unchanged. But give a heart-sedative, lessen the power of its action, and then your anodynes will prove of avail. Therefore, I say, follow out the suggestions of the paper; look after the preceding pathological conditions that led up to the local trouble. We have learned to look for causes back in the organism, back of the tissues involved in the metabolism. We restore equilibrium and build up; through the lines of chemical therapeutics and physiology much may be accomplished. If the question of the etiology of diseases pertaining to the mouth is solved by odontological science, it will hold a position paramount to all other sciences.

Dr. L. D. Carpenter and Dr. Wm. Crenshaw, both of Atlanta, Ga., addressed their remarks to the younger members of the profession, emphasizing the thought that the great work of the future lies in their hands with the increased advantages offered students in these latter days. So many duties crowd and press on the older members that they are not able to give the time and the careful thought these investigations demand.

Much in pathology that is puzzling and vexing now will be made clear, and easily handled, as the result of the work and the investigation of the younger men now taking up this great work.

Dr. J. D. Adair read a paper entitled "Ignorance and Negligence of Parents in the Care of Children's Teeth." This paper was an endeavor to formulate some method of reaching the public—other than by personal instruction at the chair—which shall not be open to the charge of violation of the code of ethics, as a form of self-advertising. The plan is a pamphlet, to be gotten up by a committee appointed by the association, and issued by the association for general distribution.

Dr. J. T. Stuart endorsed the paper, and emphasized the need of something more than the laborious and unsatisfactory method of individual effort. He said: "We have not time to give a course of hygienic lectures to every patient."

Dr. C. L. Boyd endorsed the plan suggested, and thought that endorsed by the association it would have a powerful effect on the public, and also tend to elevate the profession in the eyes of the public, showing them that we are not working solely for the dollars, nor aiming only at repairs of damages, but that we are able to offer means of prevention as well as of relief. He thought it would be well for the pamphlet to include a formula for a safe and effective dentrifice for those who do not go to the dentist, but who go to the drug store, and buy, in their ignorance, that which is worthless, if not positively injurious.

Dr. W. G. Browne thought such a pamphlet would reach only those whom we reach in our offices; that the general press is the best medium through which to reach the general public, short, terse, well-written articles on subjects calculated to interest the public will always be accepted by your daily or weekly newspapers, and will be read by those who patronize quacks, because they read their advertisements and believe in them. If you want to reach your patients, give them Mrs. Walker's book, "Letters to a Mother," that will teach them all they need to know about their children's teeth, but if you want to reach the general public you must do it through the public press.

Dr. Morgan spoke in commendation of the pamphlets in this line, one issued many years ago by J. W. White, and another more recently by "Mrs. J. M. Walker," well adapted to the purpose.

Dr. Williamson thought every dentist ought to have just such literature ready for presentation in reply to the questions that are asked, and which the dentist has not time to answer in detail while busy at the chair—questions which are suggested to the mother or the friend by the work in hand. We must educate the parents for the sake of the children.

Dr. W. H. Morgan thought it a waste of labor to endeavor to educate people who are not seeking education; that it is obtrusion to force knowledge on those who do not ask for it; if they do not desire information they will not appreciate it, while those who are already well-informed will read only to criticise. One case of severe toothache which you relieve will do more good than all your teaching in convincing the mother that dentistry has resources to cure and to prevent in the future. If the dentist secures, by his personal conduct, the respect and confidence of the public they will go to him for the care of their teeth, but no system of literature will do this.

Dr. A. S. Billings, Omaha, spoke of the value of literature of this class—not for distribution among patients but for the friends of patients, to occupy their time while waiting. Put something of this kind where they can see it, and get them interested in the subject of the teeth.

Dr. J. Y. Crawford thought it would be perfectly useless to try to teach the public the principles of any profession whether law, theology, medicine or dentistry; teach them that the professors are reliable men; that they know their business—that is all the public need to know. Therefore, such efforts as the paper proposes, whether through the public press or through pamphlets, will never accomplish much. And so we stagger along trying to reach the solution of the vexed question. Dentistry has been in existence, in a broken line, for over three hundred years, and yet the combined influence of all those years has not been strong enough to teach mothers that the first permanent molar comes in at the age of six years, and that when lost it will not be replaced by another. We are all agreed on that fact, and we make dogmatic announcement of it, and that it should not be lost by decay or removed. We teach mothers that they must not allow it to be extracted as it is the most important tooth in the jaw. But if a child is brought to me suffering from toothache and I want to save it, if the mother declines my offer, how far will she have to go to find some *dentist* ready to take it out? Dr. Morgan told the truth when he said that the logic of one successful operation was more convincing than all the arguments in literature. The logic of facts is irresistible and one filling that lasts for years speaks more than volumes, and in a language that the patient can understand. Every child born into the world ought to have the services of a dentist from the eruption of the first tooth throughout the entire life. Then we would have proper opportunities for observation. Dr. Crawford spoke at some length on the question of the relation between infantile mortality and dentition which he pronounced a most towering question—a most vital question, and one in which the tender heart of the mother is most interested. He said: Dentition is a physiological function, but alas! it is not performed physiologically in this age and country. I am one of those who believe that any departure from normal lines in tooth-evolution and tooth-eruption is largely responsible in a large percentage of infantile mortality. I ask you all to unite with me in this one thing—say to the American people: No child should be allowed to live with dental decay in the mouth; take this disease out of the mouth. No parent is excusable in permitting it to remain.

The subject of ethics was discussed at some length.

**Dr. Crawford** said: When a young man receives his diploma from a reputable college he voluntarily assumes the obligation to do *what is right* in all his professional relations. In entering into these relations he proposes to confer benefits on humanity and unless he lives up to this he violates his highest moral obligations.

**Dr. H. D. Boyd** gave, as the simplest definition of ethics, the golden rule, "Whatsoever ye would that men should do unto you, even so do ye unto them." There is no broader, deeper, truer definition of ethics than this.

**Dr. Thos. P. Hinman**, Atlanta, Ga., read a paper on "Aluminum" giving a brief history of the metal and its uses, especially in dentistry. He described the method of using aluminum in making crowns by the "Morrison seamless method," thickening the cusps with amalgam worked very dry. In vulcanizing rubber plates Dr. Hinman substitutes aluminum for tin foil for giving a polished, finished surface, as it gives no discoloration as when tin foil is used. Also as a matrix for amalgam and cement fillings, oiling the surface slightly; it is so soft that it can be formed around the tooth very perfectly. At the conclusion of the paper

Dr. Hinman passed around for inspection some shell-crowns soldered as for bridge-work, and also some small pieces of plate-aluminum united at the straight edges, with the aluminum-solder furnished by the Wilmington Dental Manufacturing Company. He stated that he had not tested the solder in the mouth and could not say how well it would resist the action of the buccal fluids.

Dr. W. G. Browne, Atlanta, Ga., spoke very favorably of the aluminum crowns. In striking them up he places wax with cotton over it in the blank for stamping the cusps and finds that it gives a fine, bulging contour.

Dr. A. S. Billings spoke of the mistake commonly made by dentists in using aluminum plate too thin and also in not taking sufficient pains to prevent *leading.* Aluminum for plate-work should not be of less than twenty guage; if gold-plated it will not disintegrate.

Dr. T. M. Allen said that thin tissue paper placed on each side of the aluminum in swaging will effectually prevent *leading* and obviate the necessity of oiling the metal which blackens it. A pickle of chemically-pure sulphuric acid bleaches it perfectly, with a frosted appearance which is very attractive. He uses the Fenner furnace and the metal furnished in ingots with the furnace which makes a very succesful casting.

Dr. Crawford prefers a low carat of gold for cheap crowns, as the necessary thickness of aluminum makes them cumbersome. For lower plates Dr. Crawford thinks there is nothing equal to aluminum swaged between Babbitt's metal dies. The plate must be carefully articulated, and not less than sixteen or eighteen Stubbs' gauge. Dr. Crawford described his unique method of swaging aluminum, as follows: Take an accurate impression and make a sand-mold and metal die. Then cover the plaster model very accurately with sheet paraffine-wax, and from this wax-covered model make another sand mold, metal die and counter die, the counter die being thus enlarged by the thickness of wax with which the plaster model was coated. Swage the aluminum between the first metal die and the enlarged counter die, and the resulting plate will be very satisfactory.

Aluminum is very kind to the mucous membrane and will not cause recession and absorption of the alveolus.

Dr. J. T. J. Watson read a paper entitled, "Dentistry—Past, Present and Future," which gave rise to a lengthy discussion of the comparative merits of cohesive and non-cohesive gold and the merits and demerits of amalgam.

Dr. C. L. Boyd read a paper on the "Etiology of the Irregularity and Crowding of the Teeth," attributing this largely to two factors—first, undeveloped maxilla, due to lack of exercise of the parts, and second, premature extraction of the deciduous teeth. To remedy the first, Dr. Boyd outlined a system of what might be termed mouth massage, a systematic but gentle rubbing of the inside of the infantile jaws by the mother or nurse, by which he claims the jaws may be so developed as to allow the deciduous teeth to erupt with sufficient proximal space to prevent decay, allowing them to be shed normally, with ample room for the permanent teeth.

In addition to the benefit derived from this passive exercise, the child is thus accustomed to having the mouth handled, and when the time comes will not object to having the teeth washed at first, and then brushed, and will submit willingly to the proper examination and care of the teeth.

For the second he would have the public, and especially mothers, educated in the proper care of the teeth.

Dr. J. H. Crossland read a paper entitled "An Original Crown."

For the crown descibed by Dr. Crossland, the root is prepared as usual for an ordinary porcelain crown. With a very fine drill, preferably one with a gauge, a series of holes is drilled as near as practicable to the circumference of the root and the interspaces cut out, forming a groove in the face of the abutment. A band of 28 or 30 gauge, 24-carat gold, is fitted into this groove and ground off to the base of the root. To the band is soldered a flat cap of pure gold, 34 gauge, using as little solder as possible, 20-carat. This is replaced in position and burnished to the face of the root. It is then punched and a platinum post placed in position, secured with hard wax, inverted and soldered, the cap being trimmed accurately to the outlines of the root end. A plate tooth is then backed with gold as follows: The tooth is ground at the gingival end to fit the cap and beveled from pins to cutting edge. From 34 gauge, 24-carat gold, a backing is cut slightly longer than the tooth which is punched, placed in position in the tooth, and held by bending the pins. The gold is burnished thoroughly to the tooth and slightly over the square end or bevel of cutting edge.

Another backing is cut, long enough to burnish over the articulating edge to thicken the gold at this point, in which a number of holes are punched to insure perfect union in soldering.

All the parts being placed in position, it is carefully waxed up and invested, as usual, for soldering.

Dr. Crossland claims for this crown that it is less bulky and more shapely than the old ferule crown; exposes no gold at the gum margin; allows a much more favorable and accurate adjustment with regard to other teeth; can be used when convergent or divergent roots are to serve as abutments for bridges; is especially adapted to conically-shaped roots; causes less pain in adjustment and will not irritate the pericemental membrane. It is very cleanly, as the joint between gold and tooth can be made about perfect. The band and cap may be made of platinum and a porcelain backing baked, producing a highly æsthetic crown.

Dr. R. A. Rush read a paper entitled "Dentistry as a Specialty of Medicine," the special points of the paper being the question, "Does the practitioner of medicine realize and recognize the great work we are doing in the prevention of disease, and the still greater work we could do with his cordial co-operation?" his conclusion being—"I don't believe he does, for if he did he would not howl so about the sanitary regulations of a city, and yet try to treat patients successfully with their mouths full of carious teeth, alveolar abscesses and other pathological conditions which render it a habitat for those germs which science has proven are deleterious to health."

In the discussion of this paper Dr. Crawford said: Magnify the idea, strengthen it, that dental surgery is a department of general medicine and surgery. In our discussions of this subject we hear much that seems to be a criticism of the intelligence of physicians. But who is responsible for the inability of the physician to diagnose the diseases of the oral cavity? I say *we* are responsible for their ignorance. It is only the legitimate sequel of our own failure in duty, and it reverts back on us to our disgrace and shame. Of all the needs in our institutions of learning the greatest need is a full chair of dental and oral surgery and public hygiene. Think for a moment and compare the value of dental surgery and ophthalmic surgery! Dentistry is the only department that touches the human system from one end of the line to the other. There is no other branch *save one* that touches the head, the heart and the life; we must all *be born*, and we all *have teeth*, but we *don't* all go blind or deaf! I hope yet to see in every medical school one member of the faculty whose duty it shall be to teach what the people need in dental surgery, and what dental surgery comprehends.

Dr. W. H. Morgan thought the charge made by Dr. Crawford not justified by facts. He said: We have not "hid our light under a bushel." We have been prolific in literature, we have text-books in the language of every civilized nation; these are at the command of medical men. We are open and free and frank and ready to impart our knowledge. Dentistry does belong to the healing art—but of medicine? No! They shut out; they refuse to consult with us; they elbow and crowd and try to keep us out.

Dr. Rush replied that he had been invited to read this paper before his own County Medical Association.

Dr. Crawford maintained that his position was correct—that while medical men are instructed in the principles of ophthalmology yet they are not familiar with the etiological factors of alveolar abscess, which is one of the most common conditions they have to diagnose; they cannot differentiate between pericementitis and pulpitis. He said, every D.D.S. is entitled to membership in any medical association, and you want to have membership in medical societies. You would then be enabled to read papers on the pathology and etiology of oral diseases; then they would look into the surgical principles involved and you could get them to see *there is something* in dental science. We want to establish our relationship with them, not for the sake of advancing theories but for the good of the people. I hope you will join your local medical societies; you can give information and you can receive help.

DR. MORGAN: I can say *amen* to all that.

DR. E. M. ROUSSEAU: The constitution of the Alabama Medical Association does not admit to membership any but those holding the degree of M.D., but all dentists are invited to attend meetings, and can be elected associate members, read papers and take part in discussions. In many cases we are called in consultation, but it is not in every community that physicians are so cordial.

This concluded the papers and discussions of the meeting.

The election of officers resulted as follows: Dr. H. D. Boyd, Troy, President; Dr. O. C. Farish, Camden, First Vice-President; Dr. H. B. Williamson, Evergreen, Second Vice-President; Dr. S. W. Foster, Decatur, re-elected Secretary; Dr. G. M. Rousseau, Montgomery, re-elected Treasurer; Drs. E. Wagner, Montgomery; P. R. Tunstall, Mobile; J. S. Bailey, Demopolis, Executive Committee.

The association adjourned to meet in Mobile the second Tuesday in April, 1895.

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## Southern Dental Association.

Twenty-fifth Annual Meeting, Old Point Comfort, Va., August 2–6, 1894.

Reported for the DENTAL REGISTER by Mrs. J. M. Walker.

The Southern Dental Association convened in twenty-fifth annual session, at Old Point Comfort, Virginia, August 2, 1894.

The meeting was called to order by the President, Dr. B. Holly Smith, Baltimore, Md., and opened with prayer by Dr. W. H. Morgan, in the absence of the Chaplain of the Post, whose presence had been expected.

Dr. E. P. Beadles, Danville, Virginia, then delivered an address of welcome on the part of the Virginia State Dental Association. He said that he was only a substitute, standing in another man's place, but that he felt himself both too short and too narrow to fill the space allotted to one who for more than half a century had been helping, by mighty efforts, to upbuild and strengthen the dental profession; one whose voice had been for many years heard in our annual meetings, and the results of whose pen were read in the dental journals all over the land; who was one of the vice-presidents of the Columbian Congress; who had been president of the Southern Dental Association, and who had filled every position, both civic and professional, with honor to himself and credit to his profession and his native State—Dr. W. W. H. Thackston—a true type of the "Old Virginia Gentleman."

He said, in the language of Dr. Crawford, I wish you, through me, to shake hands with every Virginia dentist, and to feel that our hearts are in that grasp.

We welcome you, our brothers from the North, because to know each other better will make closer friendship; you from the West, because we wish to imbibe your vim and energy; you from the Pacific slope, that you may compare the ever-rolling Atlantic with the peaceful waters of your own great ocean. We are all brothers, bone of the same bone, flesh of the same flesh. Let us join hands in the work to be done here and make this a meeting long to be remembered in the annals of dental history. "Welcome" is a magic word to Virginians; we have heard it from the time we began to lisp at our mother's knee; the "stranger within our gates" is always welcome.

Dr. Beadles then pointed out on all sides the noted historic spots, which make this region one of the most famous in American history. He concluded his address with the hope that all would find food for both mind and body, that all might depart feeling amply repaid for the trip to Old Point Comfort. Pointing to the white ribbon badge of the members of the Virginia State Association, he said, wherever you see that badge you may feel that you are free to approach and claim friendship with the wearer and that claim will not be made in vain.

In response to this address of welcome, the President of the Southern Dental Association read his annual address, which embodied a response to the address of welcome, followed by many important suggestions looking to the augmented usefulness of the Association and the advancement of the profession. The address was referred to a committee composed of Drs. J. Taft, J. Y. Crawford and B. H. Catching who, in this report at a later session, presented the following as the most salient features of the address, with the suggestion that the time of the Association could not be more profitably employed than in the discussion of these measures.

1st. The duty of our National Associations toward our State, District and Local Societies; in what way and to what extent is such aid and assistance practicable; in what way can a more intimate and closer relationship be established?

2d. The power and efficiency of State Examining Boards for good to the profession; what work can reasonably be delegated to them? In what way can they best secure the greatest good?

3d. Uniformity of laws regulating the practice of Dentistry; how can uniformity be secured? What benefits would accrue from such uniformity?

4th. To what extent is it practicable for our National Associations to influence beneficially dental education?

5th. What can our National Associations do to aid in the settlement of mooted points in practice? Is a commission for such purposes practicable?

6th. What changes should be made in clinical demonstrations to secure better results than hitherto? Can clinics be employed to advantage in all classes of dental societies?

7th. Can commissions be profitably employed for the investigation and the ascertainment of truth on assigned subjects? With what authority should such commissions be invested?

These points were presented by the committee as worthy of careful consideration.

This report was made the special order of business so near the close of the meeting that only the second and third points were discussed to any extent.

On the second point **Dr. V. E. Turner** said that it must be borne in mind that if there had not been a necessity for Examining Boards they would never have been created and laws would not have been enacted creating them.

The most disputed point is undoubtedly the examination of holders of diplomas.

Before the organization of the National Association of Dental Faculties, it was not possible for many of the Boards to know whether a college was "reputable" or not, and as long as there was an opening for doubts the safest plan was to examine all impartially. Laws have been passed regulating these matters. We have gone before the State Legislatures and presented the case and they have said we will give you what you want. We have but just gotten this, and shall we now say, we don't want it any longer? The examination of those holding college diplomas will not militate against progress in dentistry! Then why should we decry the laws requiring it? The Associations can do nothing in this matter. It is the affair of the Legislature of each State. Shall we go before them now and ask them to wipe out what we have just advocated as essential to our progress?

**Dr. Francis Peabody**: The progress of all large bodies is necessarily slow. State Examining Boards were and still are an absolute necessity, but some step must be taken to overcome the existing state of affairs in regard to the recognition of the examinations of our State Board by other Boards. I have been in practice forty years, but if I should want to locate in Mississippi I should have to be examined, if I went to Georgia I should have to go before another Board, and so of Alabama. And yet those Boards are a necessity. If the colleges graduated only competent men, there would be no necessity for Examining Boards, but there are still some colleges which work for the dollars and not for the conferring of knowledge. If a nucleus could be formed, if only one State, say one Southern State, would recognize its neighbors the idea would extend all around the borders, and great good would gradually result.

**Dr. Edwards**, Louisville, Ky., deprecated the assumed antagonism of the colleges and Examining Boards. If it had not been for the work of the Examining Boards the colleges would not have attained their present high standard. It is also a fact that the Examining Boards compel men to go to the colleges: they see that men are properly equipped. Before the enactment of dental laws, two-thirds of the men practicing dentistry were non-graduates. The Boards drive men to the colleges; that is the chief object and aim of State dental laws. As to the propriety of each State Board in recognizing the certificates of all other Boards, that would do very well if all Boards were appointed by properly-qualified parties; but in some of the States the Board is appointed by the Governor—by what virtue is he qualified to select the members of a Medical or Dental Examining Board? In other States this duty is entrusted to the State Dental Association.

Dr. J. Hall Moore: The State Examining Boards have done great good in elevating the standard of professional education. There is no conflict now between the National Association of Faculties and the National Board of Dental Examiners.

Dr. Peabody: As to examining men with diplomas, it is well known that some men get through College with very little education. A man should not be passed on his diploma; he should pass on his knowledge.

Dr. John S. Marshall, Chicago: If it could be so arranged that the Examining Boards could participate in the final examinations of the Colleges, placing their names on the diplomas, that would prove them reputable. A diploma signed by the Faculty and a representation from the State Boards would be a passport in any State of this Union, and the Examining Boards of the various States would recognize such a diploma. It is not necessary for the Boards to examine in all the branches which are taught in College, to prove a man's ability to practice in dentistry. I doubt if any member of the State Examining Boards could pass the final examinations of our College. A man who has been in practice a number of years gets rusty on those branches for which he has no practical use.

Dr. H. B. Noble endorsed the position taken by Dr. Marshall, and he hoped that some steps would be taken by means of which the endorsement of the State Examining Boards could be given to College diplomas.

Dr. Marshall said that his point particularly was that representatives of the State Boards should participate in the final examinations of the students in the senior classes; to see the written papers and assist in marking them; to take part in the oral examinations, and when satisfied that the students were properly qualified, to sign the diplomas as a passport to practice in any State whose Examining Board was thus represented.

Dr. Crawford: Before we can reach the solution of this question we must consider how the State Examining Boards are created, and what are the functions of the State Boards. The State Board is first a judicial body; it is also an executive body; and it is a supervisory body. As a judicial body it is the highest authority in the State on questions which pertain to its jurisdiction. The Supreme Court of the United States can not go behind the actions of the State Board. Decisions in various States have decided that. How then can an Examining Board be appointed by a State Society? They have no authority to confer judicial powers.

Dr. Peabody: The State Society of Kentucky is a chartered body for the purpose of creating the State Board, which is elected by the State Association.

Dr. Crawford: I doubt if their authority would hold good in law. A State Society may very properly recommend individuals to the Governor, but he alone can endow them with judicial powers. I have confidence in the integrity of our officials to do what is right when it is put before them.

Dr. Geo. J. Friedrichs, New Orleans, declared their State laws to be "class legislation" enacted for the benefit of the profession rather than the protection of the public. Too much has been done in the way of keeping out good men. We need to turn-about-face and get out some of those who are already in. No law is right which deprives a man of any of the functions of citizenship. I can't go into a certain State and enter into the practice of dentistry, because I have no dental college diploma. The only leg I stand on is that of M. D. That deprives me of my inherent rights and is contrary to the spirit of our institutions.

It is dangerous doctrine. I believe if I were to go before the Courts of any State, and claim my rights as a citizen of the United States, I believe I could beat any of your Dental Boards. The question has never been tried on that line.

DR. BEADLES, Danville, Va., thought the suggestion of Dr. Marshall impracticable. There are too many State Boards, too many Colleges and too many students graduating. It would be impossible to look after them all. A man who fails before the Board ought to fail to pass; he will go through if he ought to, if he comes from a college of high standards he will never fail; men have slipped through college—checked through—but the men who ought to pass the Board will pass.

DR. R. R. FREEMAN: We are drifting toward a point where all can unite—the good of the whole people. There is no conflict in the truth. The men of the dental profession love to uphold and sustain the right. The leaven in the lump is working; it is in the spirit of the times, in the atmosphere. The people see we are seeking their good. The Boards will do what is right. Men who come with proper credentials will be recognized as worthy, but not all the diplomas in the world, with their red and their blue ribbons can let in the charlatan.

DR. FRIEDRICHS: Dr. Freeman speaks for the people; I speak for the dentist. The man who has his diploma, or his board certificate must be able to go from State to State without further expense or trouble. A man who has exhausted his field must be able to seek another.

On the third point, DR. DONELLY, Washington, D. C., spoke of the great necessity of harmonizing and unifying the State Dental laws. As they now stand there are gross incongruities and inconsistencies. A fixed educational standard should be established. A diploma or State certificate of the attainment of this standard would bring all in practical unity. Let a law be drafted which shall meet the endorsement of the National Association of Faculties, of the National Board of Examiners, of the American Dental Association, or the Southern Association. I think the profession would all unite on such a law. Then carry it before the Legislature of one State after another and get it adopted. It would be a disadvantage to any State not to adopt a dental law having such endorsement. Dr. Turner said we could not ask for a change in the law we had demanded; I say we could, upon the ground that the law had accomplished what it was designed for, and in the natural course of progress, we now need something different. It puts a man at a great disadvantage to have to contend with this great diversity of laws. (Dr. Donelly referred to a decision of the United States Supreme Court in a West Virginia case, published in the *Dental Cosmos* late in 1890 or early in 1891).

DR. FRANCIS PEABODY spoke on the same line. He hoped that through the present meeting of the different Associations something would be developed that can be presented to the different State Legislatures that will prove satisfactory to the Colleges, to the Examining Boards and to the profession.

In this connection, Dr. R. R. Freeman offered the following resolution:

*Resolved*, That the Southern Dental Association, with a view to unity, harmony and concerted action, appoint a special committee on Dental Legislation, to represent it in any movement in which its co-operation may be sought or its "good offices" accepted for the improvement and unification of dental laws.

The following committee was appointed: DRS. R. R. Freeman, M. F. Finley, J. Y. Crawford.*

On the fifth point—The consideration of mooted points in practice.

DR. J. Y. CRAWFORD said he had been disappointed in not having been able to carry out a plan he had designed for the settlement of our mooted questions. He had understood that a paper would be presented on the methods of treating and filling root-canals. He had prepared a considerable number of teeth, properly imbedded in plaster, and he had hoped to have had the root-canals filled by the individual advocating certain methods; the teeth to be then submitted to a commission who would make sections of the roots and ascertain definitely which method was best calculated to fill the requirements of the case. The paper had not been presented, however, and his scheme had fallen through.

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*This subject was also very fully discussed in the American Dental Association, and the following committee on Unification of Dental Laws appointed: Drs. B. Holly Smith, A. W. Harlan and J. Y. Crawford, to confer with similar committees from other Associations.

Dr. Jno. S. Marshall said that for a commission to take into consideration " mooted points in practice," it would be necessary for them to review the scientific work presented; to go over experiments, study methods, etc. This would require both time and money, and unless the Association was in position to vote a fund for that purpose, the plan would fall through. In the American Dental Association money has on different occasions been voted to various sections to work out different lines of special scientific thought, but it is necessary to have money to carry this out successfully. He added that he would gladly vote for money to be spent in such scientific investigations.

Dr. V. E. Turner suggested that a committee be appointed to take this matter in hand and report at the next meeting. This committee can suggest the amount considered adequate for this purpose, and if the Association can raise it, we will have the advantage of thorough scientific investigation of certain questions, which will be reliable authority in the conclusions reached.

On motion of Dr. Jno. S. Marshall:

*Resolved*, That a committee composed of three members of this Association be appointed to serve as many as two, three and four years, to take under consideration and examination such mooted questions in practice as may be referred to it by the Association and that they shall make an annual report to the Association with such conclusions and suggestion as grow out of their individual and collective work.

Committee appointed by the Chair as follows: John S Marshall, H. B. Noble, R. R. Freeman.

In the American Dental Association a commission of five—Drs. C. N. Peirce, J. S. Marshall, E. C. Kirk, M. L. Rhein and J. Taft were appointed to investigate as thoroughly as possible, etiology, pathology and treatment of Pyorrhœa Alveolaris, and report at the next meeting. This commission was authorized to draw on the treasury of the Association for a sum not exceeding seventy-five dollars to meet the expenses of this work.

Dr. I. N. Carr, Tarboro, N. C., read a paper on "Dental Education." He emphasized the necessity for thorough preliminary education for the dental student, superior qualifications being now demanded in every department of human industry. Excellence is the only warrant of success. The dentist of to-day must have a good college education, mechanical ingenuity, and varied and substantial accomplishments for his social needs. The dental colleges have all the advantages and facilities for teaching the advanced branches necessary in professional education, but they have too many students to allow them to teach the elementary fundamental branches. They can not teach anatomy perfectly, for with two hundred students in the class only those well up in front can see what is being demonstrated. In the dissecting room he must learn what he can, practically unaided.

In this busy age reading with a preceptor is time lost; the able practitioner is too busy or he is rusty on some branches and he can furnish no dissecting material. A thorough course in a good preparatory school is of inestimable benefit to the dental student. Dr. Carr places a high estimate on the value of proper reading, selecting only the works of the best authors. Books create a social world for us; in them we find congenial fellowship; they feed the mind and by them we grow into larger stature. They add the senses of others to our own and we gain a clearer eyesight, a keener touch, more acute hearing. Life is multiplied by them. They open the highways of thought along which we are borne on distant journeys. They respond to our aspirations more heartily than our truest friends. They interpret our thoughts and make clear the dim conceptions of our own minds, perfect our half formed ideas, assure our hesitancy and relieve our doubts. We should read, not merely to get information, but to go a step higher and become thinkers.

Among the requirements of the successful, cultured dentist, Dr. Carr enumerates good manners, unaffected politeness to all, kind and gentle yet firm behavior with patients, placing himself in perfect harmony with his surroundings.

In regard to the duty of the dentist in instructing the general public, Dr. Carr suggests that the State Societies, or better still, the Southern Dental Association issue a suitable pamphlet, and that a publishing fund be created for this purpose.

In connection with points two and three of the above report, it may be stated here that able papers on Dental Legislation were read by Drs. H. B. Noble and A. W. Sweeney, of Washington, D. C. Both papers were in the line of condemnation of the State laws which require the re-examination of College graduates —laws that in the view of Dr. Noble "seem to be a slur on College and University work." If necessary to supervise the work of the Colleges, it should be done by properly-delegated authority, so that a diploma shall represent truly such a course of training and knowledge of dentistry as shall entitle its holder to practice, without further examination, in any location he may select—subject always to the laws against malpractice. A dishonest or dishonorable lawyer can be debarred from the practice of law, so, also, the dental laws should be so framed as to debar from the practice of dentistry the man who is unworthy or incompetent. The dental law of Connecticut is nearer the mark in that respect than any other State law as far as known. Under certain conditions the State Examining Board can cancel the certificate conferring the right to practice.

The laws should be so framed as to reach the advertising quack rather than to turn down some boy-graduate not quite up in book-examinations, or to catch some old graduate who is getting rusty on anatomy or chemistry. Examining Boards should handle the student before he gets his diploma, so that the diploma would represent both the Board and the College. If it believed that the Colleges are not educating their students up to the proper standpoint, then committees should be appointed to investigate and report the Colleges that are not up to the mark.

Every College should have a representative in the Examining Board of its State, to serve as a friendly connecting link, promoting harmony and mutual interest between the Boards and the Colleges. Dr. Noble suggested that committees be appointed from the Southern and the American Associations to act and confer with the National Board of Faculties and the National Board of Dental Examiners, and recommend such changes as will tend to harmonize the dental laws and promote dental education.

Dr. Sweeney's paper also dealt with needed reforms in dental legislation. Dr. Sweeney can not find in all that has been said on the subject "one particle of argument to sustain the position of those who try to maintain that no college degree or State certificate shall be accepted in lieu of examination, and that even though re-examined in one State in order to practice, it must be done *over again* in another, if the individual should see fit to move." He is not opposed to dental laws, provided they are designed to accomplish only proper results. He hopes to see laws which will not "wink at" the prosperous and arrogant quack while they are made to seize upon and terrify the young and struggling graduate who has just parted with his scanty means in the effort to learn how to earn an honest living, and are held up as a menace to the practitioner from another State or country, whose ability may be great and his intentions most honorable—laws which, if they can not be made "retroactive," can be made more clearly to define what constitutes malpractice in dentistry, and impose some wholesome restriction upon the reckless abuse of anæsthetics, which is inflicting incalculable injury, pandering to false sentiment, preventing men from seeking competent dental service and perpetuating the ignorant idea of the past generation, that the dentist is merely a tooth-puller and a maker of "false teeth."

The lack of judicious provision in our dental laws for the suppression and prevention of practices injurious to the public, constitutes their most conspicuous weakness, while the evidences which they disclose of efforts on the part of their framers to incorporate in them monopolistic tendencies, must be justly regarded as their reproach. The "protective system" is unethical, narrow, and utterly indefensible when applied to the regulation of professional practice, and a great part of the adverse criticism noted against the dental laws can be traced to obvious efforts on the part of their framers to embody in them, provisions which tend to give to dentists already in practice an advantage over those yet to enter. So long as the most unblushing charlatans are permitted to flourish in all large cities where dental laws are in force, while the law is ever held up as a menace to the graduate about to start in practice, or the competent and well-meaning practitioner from another State, just so long will recruits be furnished to the ranks of those who denounce dental legislation as a delusion, if nothing worse.

Dr. Sweeney cited as precedents the laws of Connecticut and New Mexico, which contain provisions for *working* as well as for granting licenses to practice, as contemplating a more practical effort towards the protection of the public than those which simply demand the examination of those commencing practice. A requirement barren of practical results in the direction of protection. Dental laws should be framed to protect the interests, not of the dentists of the state, not of those who frame the law, not of the colleges, but of the people of the State.

Dr. Sweeney closed his essay with the prediction that "before the first sunrise of the coming century, the honesty, the true professional spirit, and the sound common sense of our colleagues, the world over will have swept aside every clumsy and ill-advised measure calculated to retard our healthy growth, and dentistry will stand in the vanguard of the liberal professions, dispensing its blessings with an increased and ever-increasing bounty."

Dr. C. N. Pierce being called upon to open the discussion of these papers said that he was compelled to dissent from much in both papers. Why have these laws been enacted? There must have been a reason—some foundation for them—that foundation is found in the multiplicity of dental colleges. With perhaps five professors and ten demonstrators in each college, giving their services without compensation, what is the inference? They must have students and they must hold out special inducements. They say, "come to us and we will give you an education and a degree. You shall get your diploma as soon as possible." But some could not get enough students on those terms and they said virtually, we will give you the diploma without the education, and that is the foundation of our dental laws. Our present dental laws are in the line of progress; gradually they are bringing up to ideal conditions. The schools should be the creators of scholars, not grantors of degrees. In a class of two or three hundred students, it is not possible that all shall be equally studious; some are sharp, some get through and really know but little; it can not be avoided; it is the natural result of the conditions. That a student who is not qualified sometimes gets his degree is not to be wondered at; the only wonder is that there are not more! The disposition now is not only to raise the standard of preliminary education but to extend the time of study, and to make the student so proficient that he will not fear to go before any Board.

**Dr. B. H. Catching** said that if it were possible to do away with the Examining Boards it would be a bad thing for the colleges, for they would lose half their patronage; they go hand in hand. A first-class Dental College graduate has no hesitancy in going before any State Board. They need have no fear if they are competent. The examinations of the State Board are on practical lines; as a rule they are fair, easy and practical. Blot out the Examining Boards and you deprive the colleges of half their patronage.

**Dr. R. R. Freeman**: The millennium has not yet arrived. There is an unrest, an unsatisfied condition. Men must learn that to do right is the means to prosperity; we must have clean hands and pure hearts. Dr. Freeman thought the method adopted in the legal profession would be good in dentistry. A man shows what he knows before the bar; he is not examined, but if he does not give evidence of being all he claims, he is disbarred.

**Dr. H. J. McKellops**: I have not language to express what I feel. I sprang from nothing. I educated myself. I am proud of my profession, but I am not proud of our colleges or of our laws. We want laws to govern the colleges and make the professors teach the students. There are now forty schools and if a man can't pass in one he passes in another. If he can't pass the Board in one State he passes in another; but a man who has practiced forty years in one State can't go and practice in another. It is not a good law. It is not so in the legal profession. I go the world over, and I watch these things carefully. Dr. McKellops then described the existing condition of things in England and the causes leading to the present condition.

Dr. W. C. Barrett explained at length the workings of the University of the State of New York, with its Board of Regents, the methods of the Regents examinations, the relations of all educational institutions in the State of New York, including law schools, medical schools, and most recently of the dental schools to the university. It is not a teaching institution but a supervisory body, it grants charters and revokes charters. Through its examinations only are students admitted to the higher educational institutions. It established an unvarying standard from which there is no appeal. A student must have attained a certain standing in preliminary education before he can matriculate in any professional school. He cannot matriculate whether in law, in medicine, in divinity or in dentistry without a Regents' certificate. And when he has graduated he has no diploma ; he is not licensed to practice until he has been examined by a Board appointed by the Regents. If the report of the Board is satisfactory to the Regents then he receives his license. Only within the past year has dentistry been admitted on the same standing as the other profession. Dr. Barrett deems this a long step in advance. Charters are granted only by the Board of Regents, and no medical college can be chartered until it has $500,000 actually raised and deposited as an endownment fund.

Dr. Frank Abbott further elaborated the scheme of the University of the State of New York and the advantages accruing to the dental profession in that State by the alliance of the dental schools with the university. He said, if we lose in students we shall gain in self respect.

Dr. T. B. Welch illustrated the workings of the Board of Regents by the following incident which occurred many years ago: A young man desiring to practice medicine applied for a certificate from the Board of Regents. He was a graduate of a civic course college and was well read in medicine, though he had only been in a medical college four months, and in a medical office six months. He frankly stated these facts to the Board. Said he, "They took us in hand and said, 'Now boys, we have no written questions; we are not going to put on the screws, but we will have a general conversation. We do not ask you where you got your information, or how long you were in acquiring it, we shall soon find out if you are competent. If so, we will give you a certificate; if not, whether you have studied one year or ten years, you will not get it!'"

Dr. Welch also explained the requirements for permission to practice dentistry in England, and the steps necessary in obtaining a degree from the Medical Council. He said you must go to the hospital and pass two years there just as though you knew absolutely nothing about dentistry.

Dr. McKellops said that England was only acting towards American dentists exactly as one State here does towards another and he did not see why all this howl should be raised about it. There is no little feeling of jealousy in it, in arraying one State against another State, one college against another college, but simply the desire to see that men are really competent to do what they profess to do. He thought a committee ought to be appointed to visit our own colleges and look into their manner of conducting business.

Dr. W. H. Morgan thought it looked as though there was a good deal of politics mixed up in the Board of Regents business. He did not see how anything but a corrupt stream could flow from a corrupt fountain, and judging Albany by the reports in the New York newspapers it would be hard to find anything worse for wire-pulling and chicanery.

Dr. J. Y. Crawford thought the discussion had wandered far from the two papers read. Dr. Noble's paper was unique in the solution of the difficulties offered, but it had one weak point. The presence of a member of a College Faculty or a State Examining Board would vitiate the Board and deprive it of its functions; this was the decision of the Supreme Court. He himself had been in his own State Examining Board, but now that he had been elected to a College Faculty he had laid down the other position; he could not serve in a dual capacity. He was disqualified by the action of the Supreme Court.

There is but one rational, just and philosophical solution of this question. We have in each State a Board legally qualified to pass upon the reputability of the dental institutions of this country.

If it is proved to the satisfaction of the Board that they have complied with every requirement, then the diploma of that institution should guarantee to its holder the right to practice dentistry in any State in this country. That should put him in *statu quo* in every State. That is the only solution of this question. An additional feature that is required has been placed on the statute books of one or two of the States, and that is, that when a man is proved guilty of unprofessional conduct he can be deprived of his license. If it is right to disbar a lawyer if he is guilty of falsifying his word or defacing the records, then it is right to revoke the privilege of practicing dentistry if a man is guilty of unprofessional actions. This is the way to put an end to charlatanism.

DR. OTTOFY: It is impossible for Congress to supply the remedy in this case. The States are sovereign and each State must improve its own law. The bad laws that we now have, have been copied one from another beginning with the oldest.

DR. EDWARDS spoke in approbation of the Board of Regents of New York and hoped such a board of control would be secured for Illinois.

DR. SWEENEY, in closing the discussion of his essay, said he did not see why it should be deemed impossible to attain such a degree of excellence that a license granted by one Board should be recognized by another. All that is necessary is to set the standard high enough.

DR. NOBLE, closing the discussion in his paper, said in reply to Dr. Crawford, that all that was neccessary to enable college professors to hold places on the State Examining Boards was to have laws enacted to that effect. He had been on an Examining Board with a teacher from a college and found him able to supply the Board with much valuable information. It should be a matter of pride on the part of the colleges to obtain representation in the Boards, to see that their work is up to the standard of excellence of their fellowmen. If such a law is demanded it can be secured. Subject passed.

[*To be continued.*]

# COMMUNICATIONS.

## Cast Aluminum.

### REMARKS BY DR. HARPER, OF CHICAGO.

Before the 38th Annual Session of the Michigan Dental Association.

GENTLEMEN:—In demonstrating to you the Zeller Cast Aluminum Apparatus, I do so with the fullest confidence in it, and also with the assurance of a perfect plate when I open my flask after casting.

After much experience with it and other apparatus for this work, I unhesitatingly state that it is the only successful method at present before the profession. I do not mean to infer that plates cannot be cast by any other process, but it has been my experience to find that with other methods there is an average of at least one failure in ten—this, too, in the hands of an expert. With the Zeller, a man of ordinary skill can depend upon a perfect plate always.

In a successful method for casting aluminum, much is dependent upon the metal, and the Zeller alloy meets every requirement. The cast will be found clean and smooth enough to be placed in the mouth without polishing, if preferred so, as will be found in the cast made at this demonstration.

The shrinkage in the Zeller alloy is extremely small, permitting the operator to cast to plain teeth without fear of a check or imperfection. (This will be shown in the plate to be cast at this meeting.)

The tendency of pure aluminum to crystallize, with results in a very rough plate, is entirely overcome in this metal.

The metal is totally free from chemical action in the mouth. This has been proven by four years wear, and also by tests made in various solutions out of the mouth. Plates have been immersed for a period of seventy-two hours in the following solutions:

One teaspoonful of salt to one pint of water.
One tablespoonful of salt to one pint of water.
Equal parts of acetic acid and water.
Full strength of acetic acid and water.

There was absolutely no sign of chemical action and the solutions failed to give a test for aluminum by addition of the proper re-agents.

Mitchell's Dental Chemistry states: "Aluminum is soluble in hydrochloric acid and aqueous solutions of alkaline hydrates and resists cold acids, mineral and vegetable, except hydrochloric;" and my own experiments confirm this.

Plastic amalgam cannot be worked in contact with cast aluminum, particularly in an alkaline saliva, as the mercury combines with it superficially, and this in turn, when exposed to the air, takes up oxygen and forms alumina which appears on the surface as a white excrescence. Fillings of amalgam which have crystallized or hardened have no effect on cast aluminum, and a cast plate or bridge may be placed in contact with them with perfect safety.

To give a better understanding of this method I will describe it briefly from the taking of an impression to the finished plate, and this as I proceed in the casting of the case before you.

The impression (which I always prefer in plaster) should be as smooth and perfect as possible. I scrape it slightly from just behind the center of the alveolar ridge to within a quarter of an inch of the posterior margin of the plate (the same as for other plate work). I now paint it with a thin solution of shellac varnish and set aside for at least thirty minutes (this to allow it to set perfectly). I now coat the surface of the impression, except on the buccal surface of the alveolar ridge posterior to the cuspids, with a thin solution of sandarach varnish.

I have found by actual measurement that the shrinkage across the heel of a plate amounts to about $\frac{1}{120}$ of an inch, and this is enough to make the plate fit snugly, and, if increased, would prevent the plate from coming in contact with the hard palate and thus interfere with the suction. I have found that the two coats of sandarach, if the impression is covered on the buccal sides mentioned, amounts in thickness to more than the shrinkage of the metal, and for this reason is objectionable, as it makes the plate too narrow across the heel, bringing all the pressure on the buccal surface of the alveolar ridge and preventing contact in the region of the hard palate.

After coating with sandarach as described, I allow it to stand again for at least thirty minutes, after which time I dip a camel-hair brush in dry pulverized soapstone and rub over the surface of the impression; then I run my model (using for this ground asbestos and plaster of paris) and set aside for about two hours.

In cases where there is no undercut, it will be found that by careful tapping on the bottom of the impression they will separate without destroying either the impression or model, and the surface of the latter will be found smooth and polished, much the same as polished marble. If there are any undercuts, I break away the buccal or labial portion of the impression and then separate.

The above in detail is the best method I have found for making a perfectly smooth model, which is so essential in cast aluminum work.

I next wax up the case as desired, using wax about the thickness of the ordinary pink rubber, or thinner, which can be obtained at the dental depots.

The case is now invested in a Zeller flask. This differs from all others used for this purpose, in that the crucible is cast to it; also, that it has on each side of the crucible two air-escape holes which communicate with the interior of the mold by means of circular and lateral canals. In these holes is placed a piece of fine wire gauze which permits the escape of the air but checks the metal so that it can be cast under pressure.

The case, being flasked, is now placed in the apparatus and dried out slowly, which usually takes about one hour. This brings me to a very important point in cast aluminum work.

You will notice that the apparatus is constructed with two burners, each of which is furnished with an air tube for connection with the blower. The interior of the lower burner is the same shape as the exterior of the flask, except that it is a little larger, just enough to allow the flame to reach it at the point where combustion is most complete. By this means the flask is surrounded by a uniform heat, which may be regulated as desired, and will permit the operator to make it, with contents, white hot in five minutes by means of the blast. This is one of the most essential points in cast aluminum work and one that is overlooked in other apparatus.

As soon as the flask is perfectly dry I connect the blower with the lower burner and continue with the blast until the flask and contents are a bright red heat. I maintain this for a period of at least five minutes; this latter is absolutely necessary, as the contents of flask (asbestos) is so poor a conductor and requires time to absorb the heat so necessary to a perfect cast.

Being satisfied that the mold has acquired this heat I now turn off the gas from the lower burner for a period of five minutes (exactly). I now drop an ingot of metal in the crucible and turn on the gas in the upper burner, which you will notice is round and adapted to the circumference of the crucible, the same as the flask burner and for the same purpose. When the above-mentioned time—five minutes—has elapsed, I ignite lower burner with low flame, and without blast (this is simply to hold flask and contents at this temperature, and experience has demonstrated it to work best at this heat) and proceed to fuse the aluminum by means of the blast being directed around the crucible. I never allow the crucible to become white hot, as there is great danger of burning the metal which would result in a spongy plate The metal is watched closely, and as soon as it is noticed to be completely fused I insert the two brass tubes, as shown, into the air-escape holes at side of the crucible, giving them about ten seconds to absorb heat and expand to fit air-tight in the holes.

I now make my cast by creating a vacuum within the mold. This I find is done best by taking *one* long and strong inhalation with the lungs. You will notice as the air is taken out of the mold, atmospheric pressure forces the metal in, and a perfect cast is the result. I now place the cap on top of crucible and submit to pressure from the lungs, merely to make a more dense and smoother cast. It is now set aside to cool, after which it is trimmed and filed to fit the mouth.

Many prefer to place the plate as cast in the mouth. In my practice I burnish, and this is best done with a gold-finishing bur, one about the size of a pea, in the dental engine. If the plate should be cast rough in spots, I grind smooth with a small corundum wheel, and then burnish as before mentioned, always using oil for this purpose. I now finish with brush wheels and wet pulverized pumice stone and finally with a dry wheel or dry felt cone—the brush making a bluish finish, the cone a white.

I have little to say of the merits of cast aluminum work, as the sample cases I present for your inspection are sufficient testimony.

The exceedingly slight shrinkage of the Zeller alloy makes a plate which is unsurpassed for adaptation and perfect suction, as will be best understood by the following which I quote from Essig's work on metallurgy:

"Plaster expands on setting. From the impression to the model, two expansions are gone through before the fac-simile of the mouth in plaster is obtained; hence, a plate made to fit such a model perfectly must necessarily be somewhat larger than the mouth—a condition unfavorable to atmospheric adhesion; better results might be expected where the plate is somewhat smaller than the mouth, because such a condition would, in entire upper dentures, throw any under-pressure upon the alveolar ridge, while that portion of the plate covering the palatine arch would barely be in contact with the tissues; the pressure along the ridge would quickly promote absorption of the remains of the alveoli, and a uniform adaptation of the plate to the mouth would soon follow.

"On the contrary, if the plate be made to fit the plaster cast, and is a trifle larger than the mouth, the pressure will be thrown upon the palatine arch at the back edge of the plate at a region not likely to change by absorption, as is the case with the alveolar ridge, and hence the margin of the plate will imbed itself in the tissues and cause much discomfort and impair the usefulness of the denture."

In attaching teeth by rubber before flasking to vulcanize, I paint the plate with sandarach varnish, except where the rubber is attached; this prevents any discoloration which would occur if unprotected.

# SELECTIONS.

## A Contribution to Surgery from its Youngest Specialty, Dental Surgery.—The Surgical Engine.

Read in the Section on Surgery and Anatomy at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5-8, 1894.

BY W. G. A. BONWILL, D.D.S., PHILADELPHIA, PA.

While every medical man has heard and read of this instrument for the past twenty years, but few have ever witnessed the application of it in the surgery of the bones and tissues. Outside of Philadelphia—my home—it has been but little used, so slow are surgeons to take hold of new appliances, and particularly this engine, which, to so many, seems so formidable that, while they can not doubt its great efficacy yet they fear to handle an instrument driven at the high speed of from one to twenty thousand revolutions a minute.

The dental engine had been tried for minor operations and was better than nothing; yet it was not until this duplicature of the human arm and hand was developed, that it was possible to call it a truly surgical engine.

This I present you to-day, is the only type that is of any value and is based on the surest basal principles of mechanics. It is not necessary to describe it in detail. Suffice it to say that a look at its working parts will satisfy the most skeptical that it must do all that is claimed for it.

As a further guarantee of its value in surgery, I need but mention a few of those eminent in this line. Both the elder and younger Gross, Agnew, of Philadelphia, and Horsley, of London. These are enough.

Be it said to the credit of the conservatism of surgeons, it would have been more largely used had I not parted with it and sold to a manufacturing firm, hoping to have it more extensively made and better and cheaper. But I made a great mistake. It is not too late to have it remedied. As you see it here in operation there is every element about it calculated to perform any operation in surgery on soft or hard tissues, and it is so simple any one can take care of it, and so cheap that any surgeon of extensive practice can afford to have one. Beside, it is so made that it is used for a dental engine and wherever it is to be found, in any town or hamlet, in the possession of a dentist, it can be borrowed at any time and made available for surgical work by simply adding to it a crank to give it higher speed; so that an amicable arrangement can be made with the dentists for its use, and they would be too glad to be of service in assisting the surgeon anywhere.

In this way the first cost to the surgeon is nothing, further than having a few instruments adapted for its special work which would be but a trifle. Then its universal presence could be relied upon at any moment and anywhere if it is in the possession of a dentist. This one item, of combining the dental with the surgical power, must militate largely in its favor and one's surroundings can be adapted to its use. This argument is no mean one. While not so good for the manufacturer, yet to the *user* of it a favor not to be resented.

Up to the time of the death of both of the Professors Gross, not an operation on the bones was performed but I did it for them.

As to Professor Horsley, of London, he said before the Washington Congress: "Thanks to one of your fellow-countrymen—Dr. Bonwill. Without this engine I would not like to undertake the formidable operations I have to perform on the skull for removal of tumors and treatment of nervous affections."

Its range enables you to perform the most delicate as well as the most extensive operations, and can be confined to 100 revolutions or run up into the 1,000 revolutions.

It will remove in a few minutes the hardest osseous tumor, or with the diamond will cut a stone in the bladder into atoms.

In plastic surgery wherever tissues are to be united there is no loss of substance and success is more certain. In the bones, whether taking away the whole shaft leaving nothing but the periosteum for renewal of the parts—there is no necessity for opening into the bone further than merely exposing for access, thereby saving the severing of important arteries or interfering with nerve tissue. In the reduction of disunited fractures and the absolute apposition with which they are afterwards held by special appliances, it is of great value.

It can be used in fractures of the petella without opening into the membranes. Removal of the whole of the superior or inferior maxilla without other access than by the mouth. Its aid with its special appliances enables you in fractures of the skull to elevate the parts without trephining.

Removal of ths bones of the coccyx has been done in a few minutes and no injury done to the rectum or shock to the surroundings. With a special instrument I have, the vault of the cranium can be entered at any point without a trephine, and of any shape, without any danger of injury to the dura mater or much loss of bone.

In operations upon the cervix, the diamond wheels it carries at high speed chafe off the hardened tissues with but trifling loss, and enable the parts to more certainly be brought in apposition, and left nearly the normal size of cervix.

It is unnecessary to speak further of its possibilities, as the ingenious surgeon would soon see that it would be his constant companion and when once he had learned to manipulate it, it would be as much of a *sine qua non* as it is to-day a part of modern dental surgery.

No one can estimate the value alone in time saved in all cases and, from its high speed and capability of reaching 20,000 revolutions a minute, *pain* itself can almost or quite be annihilated or prevented, and if nothing more the shock is comparatively light, the effort at healing by first intention is made certain in every case, and from the smoothness of the bone cut, drilled, burred or sawed, there are no spiculæ of bone left to induce the least inflammation or necrosis.—*The Journal of the American Medical Association.*

## What Shall we Eat?

Every once in a while there is a recrudescence of vegetarianism and also many reappearances of special recommendations as to diet that are so extreme, not to say "cranky," as to suggest that the persons making them must have spoken out of the sufferings of stomachs so far from normal as rightly to be called "cranky."

The traveller from a distant planet, returning from his home and describing our habits, would say: "They prey upon other animals." It has a repulsive sound; but, of course, it is just what meat-eaters do, in spite of all the refinement and transformations that, as Emerson says, "intervene between the slaughter-house and our plates," where the slice of steak or roast reposes so tranquilly as to give no hint that it was once alive and as full of sensitive nerves as is the mouse on which the cat so ruthlessly pounces.

But let even the hypersensitive founders of the Society for the Prevention of Cruelty to Animals reflect a moment, and ask themselves if the deliberate killing of an animal, by intelligent and humane methods, is not a more merciful fate than the slow perishing by disease or old age, which certainly would occur in a state of unassisted nature.

At the two large abattoirs of Lyons, France, the guards protect the animals to be slaughtered from seeing anything connected with the slaughtering of other animals, as terror is found to have an injurious effect upon the secretions and flesh of dumb creatures. Zurich, in Switzerland, twenty years ago, invented a merciful way of killing cattle; a leathern strap completely covering the eyes is slipped over the animal's horns before he is taken to the slaughter-house. In the centre of this strap is a perforated iron block, the hole being directly over the centre of the forehead. Standing in this hole is a short, sharp, hollow, steel spike, which is driven into the brain by a single blow of a heavy hammer, producing instant unconsciousness. Immediately a sharp iron rod is made to penetrate that point in the base of the brain which corresponds to the "vital knot" of the human system, and absolute death is the result. The large blood vessels are then severed. As civilization advances, we see every-where more humane laws being enacted for what must be considered the *indispensable killing of animals*, if man is to continue on his upward career in knowledge, wisdom and happiness; for the brain-worker, far more certainly than the muscle-worker, must have flesh food to work upon.

The vegetarian can point to a considerable array of facts that sustain this theory. Many tribes of North American Indians have attained a very high physical development upon a vegetable diet; many Scotch farmers live principally upon oat-meal; meat is a comparative rarity among European laborers. Many Englishmen formerly lived on bread, cheese and beer (though cheese can hardly be called a vegetable); the Roman legionary carried a weight of sixty pounds and performed astounding feats of strength and endurance without eating flesh, and some people have substituted eggs and milk for meat, under the delusion that they are less atrocious than flesh-eaters; but the opinion of the cow whose calf they have robbed of its natural food should be asked before final judgment.

Dr. C. N. Folsom, then Secretary of the Massachusetts Board of Health, wrote twenty years ago:

"The Brahmins of India eat nothing which contains the germ of animal life, although they can hardly be said to have attained a vigorous physical or mental culture."

Mr. Edison puts the truth here hinted at more tersely in "Those who eat rice think rice," while Dr. Folsom still further says:

"Although physiologists are not agreed that *animal* food is absolutely essential to a high degree of civilization, there are certainly many facts which seem to indicate that it is resolvable into a greater amount of force than other nitrogenous foods."

That the kind and quality of food gets into a man's thought and disposition is not to be denied. The physicians at Sebastopol, after the Crimean war, testified that when a Russian soldier was intoxicated he became disgustingly maudlin, affectionate and silly, while the Briton in that state became at once "full of fight," and they accounted for it by the fact that the first lived on black bread and the second had meat. Dogs that are quiet and subdued on vegetable food grow fierce on meat, and there are persons of fine nervous organizations who find in meat a stimulus similar to that of wine.

The great advance in analytical chemistry in these last two decades has done much to reveal wherein the "potential energy" of foodstuffs lies, and the "training" of our athletes shows that we are beginning to prescribe food with as much precision as we can use the most familiar drugs—say as quinine and opium.

When James Russell Lowell went out to "rough it" among the Maine lumbermen, he was astonished to find that the essential article of their diet was fat pork, against which he at that time held a genteel prejudice; a few days of heavy tramping brought him to a complete appreciation of its merits as a heat and strength producer. These lumbermen labor intensely in the cold and snows of winter and in the icy water in spring, and beans and fat pork are the staple of their diet, and the modern chemist comes along with his physiological yardstick and tells us the exact reason why men performing the several tasks prefer pork to the choicest cuts of beef.

"The energy from the sun is stored in the protein and fats and carbohydrates of food, and the physiologists of to-day are telling us how it is transmuted into the heat that warms our bodies, and into strength for our work and thought," (Prof. W. O. Atwater).

Professor Frankland determined the heats of combustion of many substances, and reckoning them in units called "calorics." Among forty-five substances tested, he found that very fat pork contained an amount represented by 3,452, while fat beef contained 2,750, lean beef 807, and turnips only 139, while beans came up to 1,519, and peas to 1,476. Many of us do not require so much "energy" in our food, but we do need material which will restore the worn-out and ever wearing-out tissues of the body, and for this we must have foods that contain much protein, and these are beef, some kinds of fish, and eggs. All food substances have more or less of water, but the driest of all is fat pork. For a most interesting study of the whole subject, where the relative value of different substances for nutrition is shown by an ingenious diagram at a glance, the reader is referred to a series of articles by Prof. W. O. Atwater, in the *Century Magazine*, beginning in May, 1887.—*Independent.*

# COMMENCEMENTS.

## Boston Dental College.

The twenty-seventh annual commencement exercises of the Boston Dental College were held in Berkeley Temple, Boston, Mass., on Wednesday, June 20th, 1894, at 7:30 P. M.

The annual address was delivered by Rev. E. Winchester Donald, D.D.

The number of matriculates for the session was one hundred and fifty-two.

The degree of D.D.S. was conferred on the following graduates by I. J. Wetherbee, D.D.S., President of the College:

| NAME. | RESIDENCE. |
|---|---|
| B. DeF. Barton, | New Brunswick |
| Harry G. Beekman, | Massachusetts |
| Frank R. Chapman. | Massachusetts |
| Harry P. Chase | New Hampshire |
| Peter A. Caulfield | Massachusetts |
| Charles H. Davis | Rhode Island |
| Carroll A. Egan | Massachusetts |
| Henry M. Egan | Massachusetts |
| Walter E. Farris | Massachusetts |
| Homere G. Fauteux | Prov. of Quebec |
| James J. Ford | Massachusetts |
| Harry C. Gleason | Maine |
| John E. Glidden | New Hampshire |
| Arthur W. Gould | Massachusetts |
| William T. Hill | Massachusetts |
| William R. Howard | Massachusetts |
| John H. Jackson | Washington |
| Harry P. Jones | Massachusetts |
| Walter E. Knapp | Massachusetts |
| George L. Mason | New Hampshire |
| Chas. A. McGinley | Massachusetts |
| Daniel A. Nason | Massachusetts |
| Wm. F. B. Reilley | New Hampshire |
| Wm. L. Rombough | Massachusetts |
| Louis W. Scott | Prov. of Quebec |
| Wyman H. Streeter | Massachusetts |
| Lucius K. Thayer | Massachusetts |
| Jos. L. F. Taylor | Maine |
| John B. Tufts | Massachusetts |
| Albert H. Ward | Massachusetts |
| Fred. G. Weeks | Maine |
| William J. Welch | Massachusetts |
| Cyrus R. Wetherell | Massachusetts |

Total, 33.

## East Tennessee Dental Association.

The annual meeting of the East Tennessee Dental Association will be held at Athens, Tenn., 13th, 14th and 15th of September, 1894.

A cordial invitation is extended to all members of the Dental Profession.

U. D. BILLMEYER, Chattanooga, President.
A. W. PALMER, Chattanooga, Secretary and Treasurer.

# CORRESPONDENCE.

The following letter will in the main explain itself. It may be said, however, before giving it, that it is a matter of great gratification that this work has been taken up in so systematic a manner as has been done by Dr. J. W. Kasbeer.

Every institution in the country where it is found necessary to have a physician attached, should also have a good dentist as well. A well equipped and faithful dentist who should give all needed attention to the inmates of such institutions would render the labor of the physician much less than it ordinarily is. Not only soldiers' orphans but the orphans of every other class that have been brought into similar institutions for care and needed attention, should have some one to give special attention to the organs of mastication and the oral cavity as a whole.

Such service rendered these institutions should receive a liberal compensation from the public. In these institutions, usually there are children from infancy to fifteen years of age or over, which is the time of life when most scrupulous care should be given to the teeth. But to the letter:

"NORMAL, ILL.,

To the Editor of the Dental Register.

Dear Doctor:—

I wrote you sometime in November last asking a few questions in regard to my assuming a position in the Soldiers Orphan Home of this place. Finally I have made arrangements to assume the position of Dental Surgeon in the Institution, and will begin work in about a week or ten days.

The children there are from infants to fourteen years of age. The plan of procedure I have outlined is as follows:

1st. I have prepared a diagram of the teeth, both permanent and temporary, for the reception of such markings as I may see fit to place upon them. With this diagram I have prepared a blank about as follows:

Examination Blank,
Soldiers Orphan Home, Normal, Ill.
Date..........................
Name of patient................................
......................... ...............
Color.............................. Complexion.. .......... .........
Age.............. ................. Sex.......... ....................
Color of Hair..................... Color of Eyes........... .. .....
Temperament..............................................................
Date. | Record of Operations.
.................. ........ ....... ........... ...... ...............
.................................... ..............................
.................. .................. ........ ...................
................. ................ . ...........................
................... ...................................

Remarks.

Make and record thorough examination of all the mouths in the institution, using the blanks, one for each patient.

2d. Perform the most important or urgent work first, so arranging my visits to the patients as to make a complete round of the whole in at least one year.

3d. One year from the beginning compare the conditions of the mouth with the blanks of the first examination, doing such work as may then be necessary with the marks upon the respective blanks.

4th. Materials to be used: cement, Hill's stopping, gutta-percha, tin, etc., etc., and the character of other operations.

5th. Collect the children in the assembly room, and give them instructions as often as may be necessary as to the care of their teeth; the relation of their teeth to health, etc.

I shall be glad to have your suggestions in regard to regulating the teeth so early as fourteen years of age. I am,

Yours very truly,
J. W. Kasbeer."

# EDITORIAL.

## The National Meetings at Old Point Comfort.

The four National meetings of the dental profession of this country were held at Old Point Comfort the first two weeks of August.

The first was the meeting of the Southern Dental Association.

The second in order was the National Association of Dental Faculties.

The third was that of the Association of State Dental Examining Boards.

The fourth was the annual meeting of the American Dental Association.

In addition to these and during the same time there were various meetings of minor importance. There were alumni meetings, and an Association of the Teachers of Dental Technics was organized, held several sessions, and was put in good working order. There was also held a meeting of the Executive Committee of the World's Columbian Dental Congress, and several other committee meetings upon matters of special professional interest.

The Executive Committee of the Association of Dental Faculties met two days previous to the time of the meeting of the body, for the purpose of preparing the work for the general meeting. A large amount of work was brought before this committee, and of such character and extent as to occupy the time of the committee almost four days in continuous work. The general sessions of the Association occupied two days of very close, earnest work. Much was accomplished by the body that will result in great good to the profession, through its educational institutions. The dental colleges of the country are being constantly improved, and more through the influence of this Association than by any other means. The present status of dental education is due in a large measure to the work of this body. The proceedings of this Association will be published in the October number of the REGISTER, and it is not necessary to anticipate here.

The Southern Dental Association met on Thursday, August 2d, and was largely attended. It has perhaps never had a larger attendance than on this occasion. Quite a number of papers were read and fully discussed ; both the papers and the discussions were of great interest. Perhaps as interesting as any part of the proceedings was the consideration of the points presented in the President's address. These were, by a committee appointed for the purpose, arranged and presented to the Association in such a way that each point drew out very interesting discussions. To these points and the discussion had upon them we would ask special consideration by the readers of the REGISTER, they will be found beginning upon page 436 of the present number of the REGISTER.

This Association appointed a committee of three to confer with a like committee from the American Dental Association ; the duty of which joint committee shall be to take into consideration the feasibility of uniting the Southern and the American Dental Associations into one organization. The opinion was expressed by quite a number of the members that the time has now come for the unification of these two Associations. This view would seem to be almost if not quite self-evident to every thinking person. The obstacles whatever they may have been in the past, in the way of such union, seem now to be well nigh if not altogether removed. It seems unnecessary that there should be two national bodies of this kind. There is now no more reason for a Southern Dental Association than for a Western Dental Association or an Eastern Dental Association ; and, further than this, the combined strength of the two bodies would be much greater and more efficient for good than the divided efforts of the two bodies. Under such a union the mode of procedure and work of the new body would be necessarily somewhat changed from the method of procedure in either body as now presented, and the best interests of the profession would seem to indicate some such change. Both are working upon lines and by methods that have been in operation for many years, and that have become, in a certain sense, worn and threadbare. Change of methods ought, by all means, in the near future to be brought about in each of these bodies whether united or not. By this statement it is not meant that the methods employed have not accomplished desirable results, but the palpable state of affairs well warrants the statement that something in the near future must be adopted different from and in advance of past methods. It is to be hoped that this joint committee will take up this subject in real earnest and give it the consideration its importance demands.

The National Association of Dental Examining Boards met August 4th, and though not as largely represented as it ought to have been, it held sessions of great interest and importance. A subject that received much of its attention was that of uniform laws, of the various States, regulating the practice of dentistry. Certainly this is one of the great needs of our profession, and if this Association should accomplish nothing more in the next five years than to secure uniformity of these laws it would have accomplished a grand result. Another result that has been in some way secured is the more fraternal feeling between this body and the National Association of Faculties; they seem now to be in entire accord, as ought to be the case.

The American Dental Association met on the 7th of August and was largely attended and had interesting and profitable sessions. A goodly number of excellent papers were read and well discussed. New ideas were presented and many old ones put in new dress, which oftentimes is as important as the new.

This body appointed its committee of three to confer with a similar committee from the Southern, looking to the union of the two bodies.

The *bete noir* of the American Dental Association generally turns up when the election of officers comes around. Brethren, can't we have it otherwise in the future? Contention for office will never minister to the welfare of the Association.

Very interesting and instructive clinics were held during these meetings; many valuable things were presented in the way of improvements and new devices, the missing of which was a misfortune to any one who could reach them.

The present number contains a portion of the proceedings of the Southern Dental Association. The October number will contain the remainder, and a portion of the proceedings of the American, and perhaps that of the Association of Faculties.

## The Wells' Memorial.

The subject of commemorating the introduction of anæsthesia with nitrous oxide by Dr. Wells, of Hartford, Connecticut, was presented to the recent meeting of the American Dental Association, and received the hearty endorsement of that body.

A committee was sometime ago appointed by those specially interested in the subject, to take into consideration the holding of a memorial meeting in Philadelphia. This committee, after fully considering the subject, decided that it was eminently proper, and indeed a matter of justice that such recognition should be made of this notable event; and it was decided to hold such memorial meeting in Philadelphia on the 11th of December next.

At that meeting it is intended to present a more complete statement of facts in connection with this event than has been presented heretofore. This for the sake of correct history is desirable, and for the credit of the dental profession, and especially as a matter of justice and right to Dr. Horace Wells.

It is to be hoped that every practicing dentist who feels an interest in this subject will make it a point to be present at this meeting, and to do whatever he can to make it a success.

The Connecticut State Dental Association proposes to erect an artistic bronze memorial tablet, with portrait of Dr. Wells and an inscription, upon the spot where an operation under an anæsthetic was performed and the discovery made. This tablet will be placed upon the wall of the building which now occupies the exact site of Dr. Wells' office.

The committee, having this work in charge, suggest it is not merely a local matter, but that many practitioners all over the country would consider it a privilege to be on the lists of dentists contributing towards this unique memorial. The committee have sent out a circular to the profession in the United States with the request that all who wish to have a part in this matter should each make a contribution of one dollar or more. Such contributions should be sent to Dr. James McManus, 32 Pratt Sreet, Hartford, Connecticut, who is the Treasurer.

From the knowledge we have already received, we feel free to commend the meeting of December 11th as not only a memorial occasion, but it will undoubtedly be a memorable one as well, and one to be greatly enjoyed by all who may be present.

# THE DENTAL REGISTER.

VOL. XLVIII.] OCTOBER, 1894. [No. 10.

# PROCEEDINGS.

## Southern Dental Association.—1894.

Twenty-fifth Annual Meeting, Old Point Comfort, Va., August 2-6, 1894.

Reported for the DENTAL REGISTER by Mrs. J. M. Walker.

[*Continued from September Number, page* 450 ]

At the first session a resolution was adopted exempting all charter members from further payment of dues.

Also a resolution reinstating members liable to loss of membership for non-payment of dues, on payment of arrears for two years—$6.00.

The following new members were elected: J. W. Boozer, Columbia, S. C.; S. H. McKee, Americus, Ga.; J. E. Frazier, Birmingham, Ala.; C. V. Rosser, Atlanta, Ga.; I. N. Carr, Tarboro, N. C.; John S. Marshall, Chicago, Ill.

The committee on investigation of charges against Dr. E. B. Marshall, Rome, Ga., not having found any evidence of continued violation of the code of ethics, his advertising cards having been promptly withdrawn from publication, on motion of Dr. Beach, seconded by Dr. R. R. Freeman, the charges were ordered dropped in view of his long services as a charter member of the association, and his frank letter to the committee expressing regrets for his past errors due to misinterpretation but not to a knowing violation of the code. The committee was discharged.

### PROSTHETIC DENTISTRY.

**DR. THOS. P. HINMAN**, Atlanta, Ga., read a paper entitled: "An Original Method of Protecting the Tips of Porcelain Teeth in Bridgework," also "A Simple Method of Banding a Logan Crown."

He said: The most beautiful piece of bridgework is no stronger than the fragile porcelain facing that gives it its beauty; how then shall we best protect their frail portions?

In the first place always use "up-and-down" pins rather than "cross-pin teeth." The strain is more equally divided as the pins are in the long axis of the tooth and further apart. To protect them from the strain of mastication, bevel the tooth on the lingual side, from the lowest pin to the cutting edge, to a knife edge, using fine corundum stones. Back with 22 k. 29 g. gold, but not bringing the backing over the bevel, cover the backing with base plate, wax and invert. Remove the wax and flow solder to restore contour, except on the beveled portion. After the bridge is completed, burnish the remaining portion of the backing not covered with solder to the beveled portion of the facing, thus protecting the porcelain from the strain of mastication by making it on an inclined plain. If the gold is burnished down over the beveled portion before the solder is flowed, the contraction of the metal will break the porcelain.

To band a Logan crown, prepare the tooth as for a Richmond crown. Make a band of 22 k. 29 g. gold extra wide and larger at the opening than at the root end. Remove the band and grind the crown to fit the root approximately. Replace the band and drive the crown home with the band hugging tightly. Remove the band and crown and with corundum stone grind away the band in front leaving it very long in front. Grinding towards the tooth will burnish the band to it; burnishing the longest portion of the band down over the bulbous portion of the tooth at the back makes a perfect joint with no inside disk and no soldering; is strong and durable.

Dr. John S. Thompson, Chairman of Committee on Prosthetic Dentistry, reported no other papers ready from this committee, Dr. Hinman's paper was opened to discussion.

Dr. H. A. Parr, New York, having been requested to open the discussion, said that he knew nothing about Logan crowns, never having used one, but that there was nothing new in the method described of backing a tooth. The trouble with porcelain teeth backing is due to the unequal distribution of heat in soldering.

Dr. Hinman replied that the only original feature to which he laid claim was that of burnishing the backing to the beveled portion of the porcelain after the piece is soldered.

Dr. W. H. Morgan said it was certainly a new idea to him that gold could be brought into perfect contact with the tooth and stay there. His experience was that it would always spring back.

Dr. Parr: Every time you touch the gold you put more spring in it. When you get it where you want it let it alone. If pure gold is laid on loosely and properly invested, the solder will bring it to a close joint and the porcelain will not break unless a very heavy strain is put upon it. We may not make a perfect joint so there will be no leak between metal and porcelain, but we do the best we can.

Dr. W. C. Barrett, Buffalo, N. Y., agreed with Drs. Parr and Morgan as to the impossibility of burnishing gold to a close joint with porcelain. If, however, it could be demonstrated that this could be done, it would be a great step in advance, and would repay him for coming to this meeting. He would always flow solder to the point of the tooth. He spoke of the great advantages offered in crown and bridgework in saving teeth formerly condemned to the forceps, and in this respect was doing much to elevate prosthetic dentistry above the low level of many years.

Dr. L. P. Dotterer, Charleston, S. C., described a method of restoring a bicuspid in which the buccal portion was entirely gone, the palatine wall standing and the patient unwilling to have this cut off or to wear an "artificial tooth." He banded the lingual portion of the tooth, adjusted a backing to a central incisor face, soldering the sides of the backing to the gold band, and strengthening with solder to form the grinding surface, thus making a hollow crown to accommodate the palatine portion of the natural tooth, the back and grinding surface being all gold, with enough porcelain on the buccal portion for effect.

**Dr. H. E. Beach** did not think that pure gold merely burnished to the beveled portion of the tooth, as is Dr. Hinman's method, would afford sufficient strength; it is too soft and malleable and requires solder flowed over it to stiffen and strengthen it and protect the frail edge of porcelain, allowing, however, only a slight line of gold to show at the cutting edge.

**Dr. R. R. Freeman** gave his method of securing perfect occlusion of molars and bicuspids in bridgework. Get the bite in modeling compound and flow Melotte's fusible metal in this, giving an exact model on which to adjust the work without wearing away the model as when it is made of plaster of Paris.

The occlusion can be swaged between two metallic casts and made very perfect. In heating the fusible metal put a little water in the spoon with the metal, you will thus get a heat of 212° and the metal sets immediately.

A member spoke of the advantages of the English tube teeth in bridgework, they are the least unsightly, requiring no gold tips, and are easily replaced if broken off. He has been using them for several years and the more he uses them the more fully he appreciates them. He regretted there was no blackboard that he might illustrate their use both for bridgework and as pivot teeth.

**Dr. W. G. Browne** places a compressed gold cylinder under a backing of very thin platinum, and burnishes only approximately to the surface of the porcelain; when ground to a feather edge the bevel brings it perfectly in contact, and the solder follows the compressed cylinder and fills in very thoroughly.

**Dr. S. B. Cook** does not attempt to burnish down, but simply presses it to place with a soft piece of wood, annealing as necessary. He thinks the porcelain breaks because the enameled surface is broken in grinding, and that this is as injurious to a porcelain tooth as to a natural tooth; it is like taking off the dense surface of vulcanized rubber.

**Dr. Parr** seldom uses a porcelain tooth that he does not grind off some portion of the surface to get a perfect articulation and does not believe that it renders them any more liable to break.

**Dr. J. Y. Crawford** thinks this tipping and shoeing of porcelain teeth a useless expenditure of time and labor, breaking more teeth than it preserves. We must rely on non-occlusion of the porcelain, making the point of contact on the strong backing reinforced with solder. He backs the palatine surface only, making the gold slightly concave. Covering a backing of 22 k. gold entirely with 22 k. solder, piling on enough to give all the requisite strength, making it as near the size and shape of the natural tooth as possible. Before soldering the gold should be pickled to virgin purity, blackening and discoloration of the gold resulting from charred impurities.

**Dr. W. H. Morgan**: The idea that cutting the enamel of a porcelain tooth weakens it is exactly the reverse of the fact; the strength of the tooth lies in the body, not in the enamel. In soldering there must be a foundation for the solder to take hold of; instead of burnishing, better fray the surface with a rough file, and give the solder something to take hold of. Attempting to burnish the gold backing to the tooth is like planting your elbow in a feather pillow, it will cock up at the ends. Burnishing the gold hardens that side and makes it contract and draw up.

**Dr. Parr**: You have to anneal the gold and platinum the same to take the spring out of it. All these little ideas are not *new* ideas. They were known years ago to the old men who laugh at these *new ideas* of the young men.

**Dr. Hinman** being called on to close the discussion of his paper, said that he did not regret having read it as it had called forth a discussion from which he had learned "much." He still believes, however, that the gold used in the way he describes does hug the porcelain and make a close joint, not with the burnisher but with sand paper and cuttle-fish finishing.

**Dr. Crossland**: I thought I burnished the gold close to the tooth, but if all these old and experienced men say it can't be done, I suppose I don't, but it looks like it!

The subject of Prosthetic Dentistry was not reached again until the last session, Monday morning, when

**Dr. H. E. Belden**, New Orleans, La., read a paper entitled: "Articulators." After enumerating the essential features of articulators in general and the advantages and disadvantages of those now in use, he named as the special features of the Belden Articulator, that the bite can be lengthened or shortened while the plates are kept parallel; that it is capable of extension between plates for full cases, or of being brought in close apposition in single cases; that the upper plate slips back and forth to accommodate individual requirements; that the bite moves from one side to the other to correct the patient's bite; that it has a hinge-like motion to try the occlusion of each tooth as it is waxed on; that it allows a complete view of the palatine portion while the plates are closed, thus showing the articulation of the inside cusps, preventing tilting, rocking or fracturing the plate; that there are no small screws or detachable parts to be lost in the debris of the laboratory; finally that it is light and compact, and commends itself to all as a true and reliable articulator.

Dr. Noble, Chairman of Committee on Voluntary Essays, read a paper from Dr. L. G. Noel, Nashville, Tenn., entitled: "Two Useful Ideas in Prosthetic Dentistry."

The first is a combination of gold and vulcanite for bridges. Make and place in position gold shells for the teeth that serve as abutments; bring them away in an impression, from which make a model in sand and plaster. Connect the shells with a strong bar of platinum and iridium to give horizontal strength and afford attachment for the rubber. Place moulding composition about the bar and adapt it to the gum while soft, directing the patient to close the teeth upon it for a bite. Adjust suitable vulcanite teeth, and finish by usual process. It is often not necessary to take a bite, but simply wax the teeth to the bar and arrange in the mouth for articulation. The rubber can also be cut away so as not to rest on the gums so that it will not be necesary to get an impression or make a model of the gum. There are no crevices for the collection of fluids and food; it offers greater resistance to the strain of mastication than soldered teeth. There are many modifications of this idea possible; two bars can be soldered in and swaged gold grinding faces vulcanized in; fill in with solder, catching some platina pins in solder for attachments; wax on and bite into adjustment. If the teeth for abutments have long crowns and small necks extend the gold shell only to knuckle and thus avoid cutting away the enamel to get straight lines, removing the grinding surface to admit the thickness of gold in articulation. Extend the end of the bar past the shells for posterior teeth. In a case of inserting the two superior laterals, collars were cemented to the canines connected by a bar across the lingual surface of the centrals, with the laterals backed and soldered to the bar. A bar thus attached can be utilized in cases of regulating.

DR. NOBLE also read a paper from DR. G. N. JOHNSON, Concord, N. H., entitled: "Unprofessional Prosthetics," (especially the prosthesis of rubber plates.)

Dr. Johnson deplored the relegation of prosthesis among the musty relics of the past, the fashion in dentistry now is all on the line of theory and scientific investigation. Prosthesis was almost entirely ignored at the Columbian Congress while much time was given to hypnotic suggestions. A high-toned dentist airily claims that his practice is "chiefly operative," admission of prosthetic work apparently dimming the light of his professional halo. College graduates are often not able to construct a passably good set of teeth. Examining boards dwell long on the treatment of exposed pulps and septic canals, while the most abject ignorance on the subject of artificial dentures is no barrier to passing the applicant. But there is no branch of dentistry which requires more skill, judgment, scientific information than the adaptation, expression and articulation of a denture. Dr. Johnson then reviewed the symptoms of what is known as "rubber disease," and claims that the true etiology is found in the rough surfaces, knife-like edges, suction ridges, the cess-pools walled in to increase their capacity for filth, known as "air chambers." All the sharp irregular ridges, undercuts, overhanging edges, etc., are carefully preserved and presented to the delicate membranes of the mouth, presenting a surface better fitted for a nutmeg grater or a beef-steak crusher. After a little absorption, a little recision, a slight change of bearing by wearing down of the opposing teeth, and a new resting place has to be found for all these excrescences. Whether prosthetic dentistry is professional or otherwise depends, not on the material used, but on the ethics which govern and the science which directs its use. It is our professional duty to render careful, intelligent and conscientious service in any direction it may be called for.

These papers having encroached upon the time set apart for the annual elections, they were passed without any discussion.

At an earlier session, in connection with the papers on hygiene, Dr. John A. Daly read a paper entitled: "Hygiene in Prosthetic Dentistry."

He said—The care of the human mouth made dentists the pioneers in the discovery of the importance of the bacterial theory of disease which clothed the profession with new duties and larger responsibilities as sentinels at the gateway of public health. The theory has possibly been pushed too fast, if not too far, but we stand on solid ground when we say that prevention is the greatest function of the healing art. Cleanliness in things physical yields nothing to moral purity in the canons of right life; it is a useful handmaid to preventive science. The structure and functions of the mouth offer serious difficulties to the maintenance of that hygienic status which sanitation demands. If a man could be scolded or flattered into taking proper care of himself, the history of medicine and surgery would have to be written anew from the beginning; there would have to be a new birth of the present dental and medical practitioners.

Dentistry in connection with this subject has many burning questions to solve—many professional sores to salve. In the fore-front is the question of vulcanite dentures; twenty years ago we were told that we were in honor and duty bound to dismiss it utterly and forever, and yet it holds its place to-day because there is nothing to take its place. The evils charged to it are all preventable evils. The vulcanite plate as usually made presents a rough, uneven surface; if most skillfully made it is porous, if unskillfully made porosity is increased in proportion. This spongy structure, if we accept the bacterial theory, is a microbic hive or nursery, providing there is the warmth and moisture necessary for their generation, growth, propagation and nourishment. Again, being porous, it is soon saturated with the fluid secretions of the mouth, charged with organic matter in a state of decomposition which is disgusting and alarming.

A regard for common decency and the ordinary safeguards of health should not tolerate, much less participate in, creating methods leading to such menacing consequences. It has been claimed that these consequences are avoidable by ordinary habits of cleanliness on the part of the wearer, but this is not so. The wearers are not provided with the chemical solvents in which it would be necessary to steep it.

But simpler means are neither undiscoverable nor unattainable. The cheap, durable vulcanite plate can still be retained and kept in hygienic condition by interposing an efficient and suitable metallic lining between the palate and the plate. This is a thin, pliable plate of pure gold, smooth on the palatine surface, and incorporated with the vulcanite with absolute mechanical union.

A sheet of No. 60 gold foil, smooth on one side and with a rough, crystalline surface on the other, is made to fit closely into plaster molds, making a plate of vulcanized rubber on a golden base, so that they cannot be separated by mechanical means, except heat or such chemical disintegration as would destroy the denture itself; a dense, lustrous, pure gold surface, which imparts beauty to the plate—an added element of value. The lingual surface of such a plate has the highest density and is susceptible of an attractive polish. The plate is an accurate copy of the model and is practically perfect. It will occasion no rubber sore mouth, harbors no disease germs or poisonous secretions; decaying accumulations, uncleanliness, unsightliness and malefic odors are reduced to the minimum. This lining is applied in less time than is required to clean the dirt and plaster from an unlined plate. The common vulcanized denture lies under strong suspicions of being an active agent in producing serious attacks of sore throats, neuralgia and indigestion; that they aggravate these disorders is axiomatic, and no physician will permit a patient thus affected to wear an ordinary vulcanite plate until restored to full health and vigor. Gentlemen: we need to look *higher than the tongue* when we diagnose disease or ill health.

The paper was passed without discussion.

## OPERATIVE DENTISTRY.

When this section was called, Dr. E. P. Beadles, Danville, Virginia, read a paper entitled: "Anterior Fillings," of which a brief synopsis follows.

The paper was limited to the four upper incisors and the two cuspids, with reference to the operator himself, the preparation of the cavity, and the introduction of the filling material. The proper position for the operator was first considered. No operator, no matter how expert, can perform good work in a cramped, awkward or fatiguing position. To be the least tiresome, his position must be a perfectly natural one; the back bent, or the head twisted to one side will soon bring fatigue and the best results will not be attained. Dr. Beadles considers the proper positions for the operator, in operating upon the anterior teeth (and with slight modifications it is true for all the teeth), to be an upright position, standing to the side and partially behind the patient, with the head bent slightly forward. To this position the mouth mirror is an indispensable adjunct. In proof of the correctness of this method Dr. Beadles says: "I never had a backache in my life."

Dr. Beadles was especially emphatic in commending the constant use of the mouth mirror as an adjunct to the comfort of both operator and patient. In the preparation of the cavity, he said: Do not mutilate the teeth; nature knows best, and no man yet has improved upon her forms. Do not use rubber wedges for separating; dont use separators with too long a lever. All the space needed is room enough to polish the filling after its insertion, and if you have not this, wedge in a small piece of dry cotton, not too tight, and dismiss the patient until the next day, when there will be ample room. Cut away all the enamel wall on the lingual side, exposing the entire cavity to the eye as reflected in the mirror. The shape of the cavity when ready for the reception of the gold should be that of a cube or square with rounded corners; sometimes a slight groove is required in the cervical wall for the reception of the first piece of gold which should be non-cohesive always. The sides should be as nearly parallel as possible, no undercuts, no pits or retaining points. Fill over-full the groove mentioned, condense well over the cervical margin and burnish then and there. By doing this you have the margin safe and need not interfere with it again. From this point on, Dr. Beadles generally uses cohesive gold, rolling the gold between the fingers, annealing and cutting into pellets the desired size. Keep the proximal wall well burnished as you proceed, and you have finally only to polish with fine sand-paper disk finishing with use of cuttle-fish.

For instruments Dr. Beadles requires only one small, straight, round-pointed, steel-handled plugger, one flat-pointed and one or two right-angled, round-pointed, ebony-handled pluggers. When packing against the wall use smooth points, though serrated points may be used in the body of the filling if desired. Don't pound and hammer the gold too much, which only weakens it, and when the cavity is filled *stop*. Don't build on gold simply to grind it off again. Using hand-pressure, very frail walls can be built against with safety. Dr. Beadles affirmed his strong faith in hand-pressure. More force can be used as the pressure is steady and gradual, and no mechanical invention can improve upon the human hand. In many cases a cavity in the anterior teeth can be nearly filled with cement, pressing annealed gold into the soft cement, waiting for the cement to harden before finishing the filling. Amalgam may also be found desirable in a few cases, facing the labial surface with gold.

Dr. T. W. Foster, Decatur, Ala., next read a paper entitled: "Some of the Merits of a Contour Filling Made in the Laboratory."

No matter what the operation may be, it is the duty of the operator to consider the welfare of the patient, not only in the use of the best material and his highest manipulative skill, but also to adopt the method calculated to give the least pain and discomfort to the patient. Failure in this respect makes the dental profession responsible for the universal apprehension experienced in contemplating a visit to the dentist. In view of this fact Dr. Foster wished to call attention to the merits of fillings *made in the laboratory* for large contour work. The case described in the paper was illustrated by a diagram showing the mesial corners of the superior central incisors broken off from the gingival margin of the mesial surface diagonally across to the angle of the distal surface. The patient was a machinist and the teeth had been thus broken off by a blow from the handle of an iron maul. As a rule, in such cases, Dr. Foster would remove the pulp and the remaining portions of the crown and replace with Richmond or Logan crowns, but the patient, as is often the case, revolted at the idea of "artificial teeth," and would have nothing but gold fillings. To satisfy him, the right central was contoured in the usual way, the operation consuming three hours, both the patient and himself being worn out at the end of that time. In order to make it easier for both parties the left central was restored by a filling made in the laboratory, as follows: The enamel margins were beveled accurately and thin platinum burnished to the surface extending beyond the margin of the fracture. Through the platinum three holes were drilled at parallel angles in which were inserted platinum pins. The tooth was then contoured with wax from the labial surface, another piece of platinum was burnished adhering to the wax. The whole was then removed and invested, leaving the mesial surface exposed. The wax was burned out and the pocket filled with 22 k. gold solder, the investment removed, the piece finished and adjusted in little over an hour. The patient was delighted with the operation, so very easy for him and with the result also, and wanted to know why in the world he had not done the other tooth in the same way. Just before leaving home, Dr. Foster had examined the two fillings for comparison, and found that while the filling contoured at the chair was slightly pitted on the surface and the angle of the mesial corner slightly defaced, the "laboratory contour" was as perfect in every way as when it was inserted and had a much better *expression* than the "foil contour." While the final result is thus in every way satisfactory, the ease and facility of the work for both operator and patient commends itself to the consideration of all. For æsthetic results a porcelain-faced filling, as described by Evans, would, of course, be preferable, but much more difficult.

In reply to a question as to how the laboratory made filling was attached to the tooth, Dr. Foster replied: "With Justi's cement."

The papers of Drs. Beadles and Foster were opened for discussion.

Dr. Frank Abbott said that while many operations in the mouth were more or less painful, it was the duty of the operator to inflict as little pain as possible consistent with the proper performance of the operation. They are so easily rendered excessively painful by careless operating, but in order to encourage people to have their teeth cared for, as little pain as possible should be inflicted. It is exceedingly difficult in many cases to adjust the rubber dam without inflicting severe pain, and for this reason Dr. Abbott has abandoned its use except in extreme cases. It takes so much time and gives so much trouble and causes so much pain that its use is superseded in his practice by other means that occasion less pain, give less trouble and consume less time. Time wasted in accomplishing something unnecessary can never be made up again. In the use of obtunding material, twenty-five or thirty years ago, arsenic was almost universally applied in cases of sensitive dentine, and the result was numerous dead pulps, abscesses, etc. Now the country is flooded with all kinds of nostrums from all parts of the country. The *alkalies* are nature's natural obtundent.

The teeth are not naturally sensitive, but when inflamed under the action of the acids which cause decay, they become excessively sensitive. An alkali counteracting the acid restores the tissues to normal condition. Soda answers every demand and is usually harmless, but the patient must be put under regular treatment for some time, as follows: A teaspoonful of soda in a glass of water, using a little to rinse the mouth and hold in contact with the teeth twenty or thirty times a day. The second day the proportion of soda may be doubled. Then the soda may be placed directly in the cavities, and by the fourth day the teeth can usually be cut without pain. Very much of the pain attributed to dental operations is caused by bungling operators. There is everything in knowing just what you want to do and how to do it.

The question of the sensitiveness or non-sensitiveness of normal dentine was discussed at great length with the final conclusion, as stated by Dr. R. R. Freeman and Dr. Beech, that it is a question which can never be solved except theoretically, absolutely normal dentine being inaccessible. When exposed to tests through removal of its covering—the enamel—it is no longer normal.

Dr. Crawford criticized the use of platinum in contact with the dentine in Dr. Foster's "laboratory contour." He would use pure gold adapted to the walls with soft-wood points. Dr. Crawford objects seriously to the use of any two metals in a tooth, as platinum and gold in Dr. Foster's case, and especially the combination of metals in the amalgam alloys.

Dr. W. H. Morgan has had no experience with contour fillings made in the laboratory, but has found contour work done at the chair so satisfactory that he sees no means for changing his methods. He does not understand how or why such a filling as that in the right central could require over three hours' time or prove exhausting to either patient or operator. On one occasion he had a similar case except that it was necessary to fill the root also. Being a clinic "the boys held the watch on him," though he was not aware of the fact. The filling consumed six and a half sheets of No. 5 gold and was completed in fifty-five minutes by the watch.

Dr. Foster: I did the best I could and I learned under you! Dr. Morgan objected to the dogmatic style of Dr. Beadles' paper as not being scientific. No set rules can be laid down to fit every case and every operator. He said: I have been filling teeth for many years, but I do not always use the mouth mirror. I have other use for my hands in many cases. Standing "perfectly erect at the side of and partly behind the patient" will not answer in every case. I want to look into the mouth and see what I am doing. I want to see the other end of my instrument, and there are many cases where I prefer to stand in front of the patient, and often at the left side. In regard to the rubber dam causing so much pain that it is better not to use it at all, I find that I inflict as little pain and inconvenience with as little trouble and time with the rubber dam as with anything that can be substituted for it. Neither can I endorse the rule of never using rubber wedges. There are cases where nothing else will do, though I always seek to inflict the minimum amount of pain. In some cases enough cotton cannot be inserted without crowding it up into the gum in the interdental space.

Neither is hand-pressure the one mode above all others. The true philosophy in these matters is to examine into all the conditions and be governed by the environments and not say, dogmatically, this way only and never any other. Much depends on the idiosyncrasies of the patient and every case must stand on its own merits. Dr. Morgan spoke of the various methods of obtunding sensitive dentine and commends the spray apparatus with ether, cooling the tooth until it is benumbed, but not continuing it too long, which causes excessive pain. The tooth is less sensitive if kept perfectly dry, and this is impossible without the use of the rubber dam, which, therefore, becomes a very important adjunct in lessening the pain caused by cutting the dentine. In regard to the general use of arsenic, as mentioned by Dr. Abbott, Dr. Morgan thinks it could only have been used by the ignorant class of practitioners, as even horse-doctors have always been familiar with the effects of arsenic in causing slough of soft tissues, as used by them in curing fistula, etc. A very little particle of arsenic inserted in the fistula and closed in, has sometimes caused diseased tissue "as big as your head" to slough out. Any dentist, except the very ignorant, must have known it would cause the death of the soft tissue in the tooth and beyond.

Dr. Friedrichs uses hand-pressure in preference to mechanical. The rapid blow of the latter hardens and condenses only the surface of the gold, while hand-pressure spreads it in all directions. His experience has been that the mallet is very objectionable to the patient, and unfavorable to the operation.

Dr. Cowardin thinks that the sensitiveness of dentine is due largely to individual idiosyncrasy and constitutional conditions. Patients of rheumatic and gouty diathesis suffer exquisitely from sensitive dentine. The dentine is abnormally sensitive from constitutional irritation.

Dr. Frank Holland does not see what the condition of the blood has to do with the condition of the dentine. If a patient is irritable from disease he will complain more, but that is no proof that he suffers more than another.

Dr. Barrett: Pain is the index to abnormal conditions. Normal tissues are not sensitive. There is no true nerve tissue in the dentine. The protoplasmic elements contain the elements of nerve and other tissues but normal dentine is utterly and entirely without sensation. The pulp itself in its normal condition is without sensation. How often do you not, in excavating a cavity, expose and touch the pulp and the patient is not cognizant of it, but if you allow it to remain exposed until it becomes inflamed, then it becomes exceedingly sensitive. Only when abnormal through irritation does it awaken to the power of conveying the sensation of pain.

Dr. Friedrichs: Is that a hypothesis, or can it be demonstrated?

Dr. Barrett: It is simply axiomatic and does not need demonstrating any more than that $2+2=4$.

Dr. Pierce does not agree with Dr. Barrett. Whether normal or not normal, terminal filaments are always sensitive. You cannot touch them without thus conveying an impression, though the degree of pain may vary. In the interzonal layer you will always get a response, at the border line passing from the enamel to the dentine.

Dr. R. R. Freeman to avoid the continued pain, day after day, caused by the use of separating rubber, wooden wedges, cotton, etc., uses the modern mechanical appliances known as *separators* with wonderful satisfaction both to himself and his patients. He said—Put on the separator and start the screws, look your patient in the eye and presently you will see a look come over the face that warns you to stop; let down a little and wait, the patient will conclude " why that wasn't as bad as I thought;" then start it again, and you will easily get all the space you want, and it is all over at one sitting without prolonging the agony for days and perhaps a week. I began to use the rubber dam as soon as it was invented because I knew I would give less pain if I could keep the cavity dry, and it gives me the free use of both hands so that I can work to better advantage in every way. There are some irregular cases where these appliances will not fit and where neither rubber nor wood will answer, and then you must resort to cotton. Where it seems impossible to get anything in, that is where cotton works to the greatest advantage, roll a little particle of cotton fibers in a waxed silk ligament and you can draw it in between the teeth, tying it so that it will not work up to the gum, and the moisture will swell that little bit of cotton and give you the needed space. In some cases pain is a benign influence and is wanted as a warning, but there is no necessity for inflicting avoidable pain. Establish the confidence of your patients that you are not going to inflict unnecessary pain; make them feel that you are the captain who is going to carry them safely through, *and they won't suffer!*

**Dr. Beach** endorses Dr. Freeman's use of the separators. He does not believe in the slow process of wedging, with its prolonged pain. He knew from his own experience that even a little fiber of floss silk broken off between the teeth causes worry and irritation till he gets it out, and therefore he will not subject his patients to wedges of rubber, wood or cotton to remain between the teeth for several days. He spoke of his own experience with a duct-compressor, which theoretically promised to be something very nice. After having it used in his own mouth, he would never consent to use it on one of his patients though it might be very lovely as far as his own convenience was concerned.

**Dr. Beadles**, in closing the discussion, said that he had not intended to lay down any dogmatic rules for the governance of others. He had only desired to state the methods through which he had personally attained the greatest success, that possibly some might be benefited by the hints thus thrown out.

The subject of Operative Dentistry was passed at the close of this discussion, but at a subsequent session several voluntary essays were read which properly belong to this section.

**Dr. W. V. B. Ames**, Chicago, read a paper on a new cement which he calls "Oxyphosphate of Copper" and which he considers invaluable in what may be called "desperate cases." It is compounded by mixing black oxide of copper-cupric oxide with a solution of phosphoric acid. A phosphate of copper *per se* is formed which is held in solution in an excess of phosphoric acid. The cement is used in a plastic state and penetrates the tubuli of the dentine exerting a positive embalming effect. It is insoluble in the fluids of the mouth after crystallization. It is contra-indicated for crown setting from its caustic nature, but is valuable for filling purposes where conditions admit. It cannot be used indiscriminately as it might cause an occasional devitalized and mummified pulp. Its permeation of the tubuli makes its use advantageous when it is impracticable to thoroughly remove all of the semi-disorganized dentine. It arrests further destruction of that tissue and corrects the sensitiveness which renders further excavation impossible. Very sensitive cavities may be filled with no preparation beyond securing fairly good margins. After a few weeks they can be satisfactorily prepared for a more thorough operation. It is most satisfactory in stopping cavities in the temporary teeth, as it can be done after very indifferent preparation, which is a boon in the management of little patients, as the deciduous teeth can be preserved through their natural term by this means.

The fissures in the first permanent molars can be sealed up with this cement without putting the child to any discomfort, also in the treatment of those trying grooves and cavities in the buccal surfaces of molars and the sensitive place in the palatine surfaces caused by the contact of vulcanite or other plates. There is no necessity for anchorage in its use. Where there is a cavity below the gum-line with a fungous growth filling the cavity, excise the fungous growth and place a gutta-percha filling against it until the surface is healed, and then fill with cupric phosphate. The tissue will remain healthy in contact with the surface of this filling, as the cement presents a very smooth surface if not disturbed while crystallizing. It must be used in an almost fluid state; crystallization is hastened by projecting hot water upon the surface as it congeals. The moderate rubbing together of powder and fluid which suffices for the ordinary cements is not sufficient for this cupric phosphate. The powder is added directly to the liquid until a stiff mass is obtained; then with vigorous rubbing on a broad slab with a broad stiff spatula, the mass is reduced to a fairly watery state, the rubbing being continued till it is brought to an unctuous, creamy state, resembling oil-paint or printer's ink, which runs slowly from the spatula in a stringy manner. This confirms the statement that "the least reliable cements are the most easily manipulated." In packing, the cement will adhere to the cavity wall rather than to the packing instrument, though a film of the powder on the instrument will facilitate packing it. This cement has good working qualities and is very adhesive to dry tooth-surface. If the filling is not treated with hot water (protecting the soft tissues with napkins) a very objectionable copper-salt taste will be complained of.

**Dr. W. G. Browne**, Atlanta, Ga., read a brief paper entitled: "Varnishing Cavities."

Because of the admitted incompatibility of the metals and tooth structure, gutta-percha, chloro-percha, the cements and varnish have all been tried in the effort to overcome the difficulty. As a non-conductor against thermal changes and as an insulator against electrical changes, Dr. Browne finds that a clear resin, such as damar varnish, dissolved in chloroform, offers many advantages, as it is not soluble in the fluids of the mouth, does not discolor, and prevents the discoloration from the oxidation of amalgams showing through their enamel walls. It also acts as a support to frail walls by inserting the filling while the varnish is in a plastic state. For a large gold filling he utilizes the varnish to hold in place adherent to the dentine a mat of crystal gold, or the first cylinder, in commencing the filling. He wished it distinctly understood, however, that he did not depend upon the varnish to retain the filling itself but simply to facilitate the start, though with its assistance deep retaining pits are made unnecessary, slight undercuts being all that is required, thus saving valuable time. No harm can possibly result from its use, while its advantages are clearly apparent.

**Dr. W. H. Morrison**, St. Louis, Mo., read a brief paper on "The Care of Infant's Teeth."

He said that, as a rule, the dentist is not consulted early enough, parents waiting till the teeth are eroded and decayed beyond repair. When they are placed in our charge from infancy, we should adopt the line of treatment suggested by nature, when the child stuffs its fists into its mouth, biting on anything within reach. This is very suggestive and if the mother or nurse will systematically rub the alveolar ridge and palate with the thumb and fingers, expanding the arch in the natural direction this will greatly aid their growth and development. The lancet should also be used over the points of greatest tension. This alone will often bring the child out of spasms and save its life. Do not give drugs and "soothing syrups," but rely on physical development. If a change has to be made from mother's milk, then give the milk from a healthy field-fed cow. Condensed-milk-teeth are not up to the standard. Rely on outdoor air and sunlight, physical culture and development of all parts of the body harmoniously, and in troubled dentition adopt this system of massage in the mouth. This is also to be recommended for older children in cutting the second teeth. By pressure of the thumb and fingers or the knuckles on too prominent points inside or outside of the arch will aid greatly in preventing irregularities, as the parts are cartilaginous and yield readily to such pressure.

These papers were passed without discussion.

[*To be continued.*]

## Every Man to His Trade.

I know a woman who has five doctors whom she consults at regular intervals. Number one, who is of most importance, looks after her general system, and is consulted when the trouble cannot be definitely located. Number two is the eye, ear, and throat specialist. Number three takes care of her skin and complexion. Number four has tackled her hæmorrhoids, but has not cured them; he is the "rectologist." Number five, ah, number five! he is in the swim just now; he palpates the appendix, the ovaries and their accessories, and is ready for a laparotomy should a pain strike his territory. I know she has also been in the hands of the dentist and chiropodist.—*Louisville Medical Monthly.*

# The American Dental Association.

Thirty-fourth Annual Session, at Old Point Comfort, Va., August 7th, 1894.

Reported for the DENTAL REGISTER by Mrs. J. M. Walker.

The American Dental Association convened in thirty-fourth annual session at Old Point Comfort, Va., August 7th, 1894.

The meeting was opened with prayer by the Rev. H. L. Cheatham, Hampton, Va. After an eloquent address of welcome on the part of the Virginia State Dental Association, and the transaction of some routine business, Dr. J. D. Patterson, Kansas City, delivered his annual address. In his address Dr. Patterson paid a touching tribute to the memory of the many members of the association who have passed away during the past two years. He then turned his attention to a number of suggestions looking to increased usefulness of the association. He lamented the "undigested science" and "trivial repetition" which burden the records of the society instead of original scientific matter, the result of diligent labor and thorough investigation. He deplored the lack of self-sacrifice on the part of the many, based on the mistaken idea that to but few is given individual power; but, he said, this is given to all who really work for it. There is no department of science in which investigation will not reward the individual; not half-learning, not superficial science—this brings but ephemeral reward.

The historic method of working by "sections" fails, because so few members of the section assist in the work assigned. So long as the work is voluntary, each one waits for the others, and the result is that the work is all done by a few enthusiastic members and new talent lies undiscovered. If each one would realize that his membership obligates him to make some report, be it much or little, strength would be developed which would give a new impetus to the American Dental Association. The proposed revision of the constitution offers the opportunity of incorporating valuable new features. Among others, that of a "supervisory committee of work" with clearly defined duties looking to more perfect scientific results. Another would be the reservation of the association proper for scientific work, leaving all business routine out of the regular sessions. In a brief review of the allied forces in dental education, the colleges, professional literature, dental legislation, etc., he noted memorable activity and improvement during the past two years. He hoped that some plan would be formulated for the unification of dental laws in the different States so that a certificate of registration in one State would be recognized in any other. He pronounced the present status of dental legislation a travesty on justice and equity.

He recognized the work of the World's Columbian Dental Congress as a prominent factor in the activity of the past two years and rendered due meed of praise to those whose labor of love has been so richly rewarded. He regretted the great increase of unethical practitioners as a drag on professional purity, reputation and advancement. He characterized them as the "anarchists" of our calling. No line too strict can be drawn in this direction; we must permit no infringement upon the strictest letter and spirit of the code of ethics.

The president's address was referred to a committee of three: Drs. Abbott, Crenshaw and Brophy, whose report at a subsequent session, Wednesday, 8 P. M., placed the prominent points of the address before the association, resulting in an interesting discussion. Their consideration of certain points in the address led them to suggest (1) that in the revision of the constitution, clinics in surgical and prosthetic dentistry be re-established, though this step was not directly suggested in the address. After some discussion *pro and con*, Dr. C. N. Pierce said that it was well known that clinics had not been abandoned by the American Dental Association except after very serious consideration. He moved that the matter be referred to the executive committee "with power to act."

DR. THOS. FILLEBROWN pronounced this a cowardly way of meeting the question. As a matter of fact, the association either wants or does not want clinics. He moved that the matter be laid on the table indefinitely. This motion being duly recorded, was carried.

2. That the suggestions in regard to registration certificates of one State being made valid in another State, without further examinations, were impracticable so long as the members of the Examining Boards were selected in so many different ways. On motion of Dr. B. Holly Smith, a committee of three, Dr. B. H. Smith, A. W. Harlan, J. Y. Crawford, were appointed to confer with similar committees from other dental associations, national, State or local, in an effort to secure unification of dental laws in this country.

3. Various methods were suggested of securing more efficient work in the sections, especially something from each member. The most feasible idea was that suggested by Dr. Weeks, of Minneapolis, that the chairman of the section make a specific request of each member of the section. It would of necessity be optional with each one to answer or to refuse to answer, but the various replies received, properly edited by the chairman, would in itself furnish a special report!

Other portions of the address were referred to the Committee on Revision of Constitution and By-laws, and the subject was passed.

The subject of the coming celebration by the dental profession of America, of the fiftieth anniversary of the discovery of anæsthesia, by Horace Wells, of Hartford, Conn., was introduced by Dr. J. V. Thomas. He mentioned the steps taken by the Odontological Society of Philadelphia, but said that the subject was one of national importance, and too great for local societies to handle. On his motion a committee of nine as follows: Thomas, Fillebrown, Taft, McManus, W. H. Morgan, W. C. Barrett, Harlan, McKellops and Weeks was appointed to consider the matter and report to the association.

DR. MCMANUS called attention to an article on this subject recently published in the *Century Magazine* as being not only misleading, but as containing statements that are absolutely false, and desired that the association re-affirm the resolutions adopted in 1864, based on the results of an official investigation by a congressional committee. (The facts in the case are contained in a work on modern anæsthesia published in 1867, by the late H. F. Smith, United States Senator from Connecticut.)

Dr. Brophy suggested that in any resolutions adopted by the association, the words "United States of America" be omitted, as this is not a local affair. The benefits of modern anæsthesia extend over the whole world.

Dr. Harlan thought it essential to insert explicitly the date of the publication of the results of the legal investigation that fully established the claims of Dr. Horace Wells; to fix the time and place, when and where the investigation was held, and where the documents are published that give the results of this legal investigation.

At a later session the committee reported a series of resolutions and a partial programme for the celebration, which will be published when all arrangements are perfected.

On motion of Dr. H. A. Smith, Dr. J. N. Crouse made a report on the present status of the litigation being conducted by the *Dental Protective Association.* He said that the past year had been one of special activity in securing testimony in the Low Bridge Case, testimony having been taken in Denver and even in California. The testimony is all in now, and the case will be argued in October, and then the result of all this labor will be made known. He considers that there is abundant evidence in to defeat the Low Patent in any Court. Dr. Crouse requested that a committee of three be appointed to meet a similar committee of two from the Southern Dental Association, to examine the books of the Dental Protective Association, papers and vouchers, notes and mortgages, and pronounce whether the moneys of the association had been honestly and economically used. The available funds of the association were about $3,000 apart from a mortgage note of $10,000 on real estate, on which it would not be possible to realize at present without great sacrifice. He did not know what the lawyer's fees in the present case would be, but possibly it might be necessary to impose an assessment on the membership rather than touch the mortgage fund. The chair appointed Drs. H. A. Smith, C. E. Esterly and Louis Jack, on this committee—Drs. R. R. Freeman and V. E. Turner having been appointed by the Southern Dental Association. At a later session the committee reported that they had examined the books and papers of the Dental Protective Association and found everything correct and satisfactory. On motion the report of the committee was received and approved.

The resignation of Dr. M. G. Jenison, Minneapolis, was received and accepted.

At the night session Tuesday, on motion of Dr. W. W. Walker, Dr. John S. Marshall, Chicago, as treasurer, offered a report from the executive committee of the World's Columbian Dental Congress showing the present financial status. This statement embraced a detailed account of all moneys received of the treasurer from foreign countries and from the different States and State Societies of the United States, making a grand total of $13,790.05, not including $400.00 in the Columbian National Bank at the time of its failure, from which dividends amounting to $249.74 have been received, making the sum of $14,309.79 received. The disbursements have somewhat exceeded this sum, and by the time the bills for publishing the Transactions, including contracts for engraving illustrations, etc., there will be a probable deficit of $1,000.00. The above statement does not include the expenses of the executive committee for railroad and hotel bills, etc., amounting in all to some $4,000.00 which has been cheerfully donated to the Congress. It is desirable however that the sum of $1,000.00 be raised to pay for the Transactions, that they may be distributed to those entitled to them as early as possible. Various methods of covering the deficit were suggested. Finally, on motion of Dr. H. A. Smith, duly recorded, an appropriation of $500.00 from the funds of the association was voted to the executive committee of the World's Columbian Dental Congress. Dr. Marshall stated that there were three hundred of the memorial medals still on hand and for sale at $10.00 each. Also extra copies of the Transactions could be secured, and he hoped by these or other means to raise the other $500.00.

At a later session, Dr. Marshall announced that he had raised $260.00 and hoped to complete the sum of $500.00 before the close of the meeting. The Transactions had to be paid for and it was not right to allow the members of the executive committee of the Congress to pay the bill.

A meeting of the National School of Dental Technics was announced for 3 P. M., August 8th, Dr. J. C. Stephan, Secretary.

SECTION 1. PROSTHETIC DENTISTRY was then called.

DR. W. E. SHARP, Binghamton, exhibited and explained a new furnace for general laboratory purposes—continuous gum, porcelain, aluminum and other metal work, etc., which apparently offers many advantages over the other furnaces for similar work now on the market. As now manufactured it is only adapted to the use of gas as fuel (with No. 9 A, Buffalo foot-blower), but will probably be adapted to the consumption of gasoline, coal oil, etc. In reply to questions it was stated that it fully replaces the coke furnace for continuous gum-work; heating up is done very rapidly; there is no lost heat, but the heat can be perfectly regulated to suit the work in hand whether for low-fusing enamel, aluminum casting, or any work for which a furnace is required.

DR. GEO. EVANS, New York, demonstrated his method of constructing hollow gold dummies for bridge-work. The band and cusps being completed, a little ball of fluxed solder is placed on a piece of platinum, 30 or 32 gauge, over which the hollow crown is placed. Heat being applied beneath the platinum, the solder flows to the edges all around on the inside. The edges of the platinum are then trimmed and stoned down forming a hermetically-sealed, hollow dummy.

Dr. Evans also demonstrated a method of crowning front teeth, the root being banded on the approximal and palatine sides with no gold showing at the labial surface. A peculiar feature of the method is the means by which the pin is securely fixed in the cap. By means of a suitable die a small countersunk spot is formed in one end of a long oval disk, the opening of the root canal being reamed out to receive this depressed portion of the cap—pure gold is melted into the concave space, through which the pin is screwed, being held firmly in place by the thickness of gold in the depressed portion. The disk and pin is then adjusted to the abutment of the root and trimmed even with the labial portion, the projecting portions at the approximal and palatine sides being snipped and turned back on to the root, removing and annealing as necessary. The porcelain tooth being backed as usual and soldered to the cap in such a manner as to secure perfect continuity of all sections of the crown, giving all the strength of the regular crown with no metal appearing at the cervico-labial margin, while simplicity of construction is promoted. The crown is secured to the root with oxyphosphate, but a special feature in Dr. Evans' method is that a film of gutta percha is put on the pin before inserting it in the cement in the root canal, so that in case of accident it is easily removed, heating the crown in the mouth with a suitable instrument, softening the gutta percha on the pin so that it is readily withdrawn leaving the cement in the root canal to be reamed out for re-insertion of the crown. Dr. Evans' methods were discussed by Drs. Freeman, Sill, Crouse, Gardiner, Brophy and others, many questions being asked and answered.

Dr. Brophy said: All this leads us back to the days when we had *clinics.* Such methods as these cannot be clearly and satisfactorily explained without an ocular demonstration. Telling a person how to do such things is never as satisfactory as showing him how it is actually done. I hope the time will come when clinics will be re-established in the American Dental Association. Every one would be glad to see the methods of a man like Dr. Evans practically demonstrated.

Dr. H. B. Noble presented Dr. Daly's method of lining vulcanite plates with an indestructible lining of pure gold—a lining which lasts as long as the plate itself and which gives a smooth, even, polished metal surface next to the mucous membrane of the mouth. The lining is produced by depositing crystals of pure gold on one side of a sheet of No. 20 gold foil 'till it attains the grade of No. 50 or 60 foil. The lining material thus has a smooth, polished, bright gold surface on one side and a roughened crystalline surface on the other. To apply it, after the flask has been opened and the wax removed, the cast is varnished with sandarach varnish and dried. A coating of damar varnish is then applied to give a sticky surface so that the lining material will not slip or slide out of position. The lining is cut in small pieces varying from one-fourth to one-half inch, varying in shape to suit the surface to be covered. The pieces are laid on with the bright side down and overlapping so that there will be no cracks or uncovered portions, every portion of the surface being perfectly covered with the lining. The overlapping of the small pieces is an important feature in adjusting the lining to the cast. The rubber is then placed as usual, being careful not to have it thicker than necessary, and of uniform thickness throughout. Vulcanize the piece as usual. In finishing up the piece, burnish and brush the gold surface fearlessly. It cannot be rubbed off. The vulcanite piece thus lined has a solid gold surface and is as cleanly as an all-gold plate. The rubber thus vulcanized on the gold lining is more dense than by any other method.

Dr. St. George Elliot described a method of swaging through the force of steam power, the work being done with great rapidity and perfect ease to the operator.

Dr. Custer described a method of swaging plates with shot instead of counter-die, also the process of melting platinum almost instantaneously by means of the incandescent light current.

Dr. Bogue described a hydraulic press for swaging metal plates giving, with very little trouble, a more perfect adaptation to the plaster model than could be secured by the hammer or a pile driver.

Dr. Butler apprehended that it would be found, if carefully tested, that the gold had been thinned to a very considerable extent in places, making the close fit at the expense of the strength of the plate.

Dr. Bogue replied that it was necessary to use judgment in applying the force. One young man burst asunder a ring of malleable iron three-fourths inch in thickness. The subject was discussed and various methods of swaging by mechanical apparatus designed to replace the hand power and sledge hammer of the operator described.

Dr. V. H. Jackson, New York, described, from a series of large-size illustrations (copyrighted), and a number of plaster-casts, his "crib" method of regulating and retaining appliances. In these appliances Dr. Jackson uses German silver wire, 14 gauge, using soft solder unless there is great acidity of the oral fluids, or the fixture is to remain long in place. If a permanent fixture, to hold in position teeth loosened by pyorrhœa alveolaris, he uses iridio-gold or iridio-platinum wire. For a strong spring wire he uses piano wire tinned, if it is to remain in the mouth for some time. The crib-springs are of German silver wire slightly larger than the piano wire used. A number of special cases with the fixtures used were described as illustrated by the diagrams exhibited, which are essential to an understanding of the method.

**Dr. J. Y. Crawford** asked Dr. Jackson what he thought of the propriety of removing very loose teeth, and after the removal, of all deposits, replacing the teeth in the mouth.

**Dr. Jackson** replied that a tooth which had been affected by calcareous deposits was not a fit tooth for replantation. A replanted tooth if held at all was held by granules of living tissue penetrating the interstices of the tooth substance. Calcareous deposits on the teeth infiltrate these spaces, while the roughened surface left after scraping off the deposits creates an inflammatory condition in the surrounding tissues and the tooth is thrown off. No artificial means can restore the smoothness of surface nature requires.

**Dr. W. H. Morgan** rose to a point of order—the discussion was invading the field of pathology, which will be discussed in connection with other papers. Dr. Morgan asked Dr. Jackson what was meant by the term "spring gold?"

**Dr. Jackson**: Simply what is sold by all dealers as *spring gold*, I suppose it is platinized gold.

**Dr. Morgan**: The best spring gold is made by the addition of one-tenth part of platinum added to pure gold. If two parts platinum is added to the ounce of 22 or 23 carat gold, it makes a very good spring gold.

**Dr. Jackson**: A very important thing would be a non-corrodible metal with the spring of steel; a metal that could be heated many times and yet retain its spring. I have an experienced metallurgist experimenting in this direction and hope to get it yet.

Dr. W. O. Kulp explained a method of retaining in place loose incisor teeth with extensive absorption of the alveolus. His method differs from that of Dr. Jackson in that the entire lingual surface of the teeth is covered with gold bands which extend under the free margin of the gum, being cut nearly down to the gum line at the labial surfaces of the teeth. The portion on the labial surface may be of platinum, which is less offensive to the sight than gold. The bands are all soldered together in the lingual side making a continuous metal surface, securing the loose teeth so firmly that they have been retained in the mouth for twenty years after they were so loose that it was difficult to keep them in place while adjusting the bands. He had utilized the same idea in case of a fracture in the center of the lower jaw, soldering a plate to the bands after adjusting the fracture. The day after this fixture was adjusted the patient came to him saying: "Thank God; I was able to eat a beefsteak for my breakfast." A regular surgeon predicted at the time that there would be no osseous union, but six months later the case was reported a perfect success.

Dr. J. N. Crouse described an automatic pump, worked by water pressure, for condensing air in a cylinder giving a current of air, or a blast sufficient for any purpose desired, whether for continuous-gum furnace, or for soldering. He has it connected by piping up to his laboratory table when he has simply to open a stop-cock to get any amount of air wanted. They are too high-priced at present but he hoped to be able to handle them soon at $15.00.

Dr. W. O. Kulp said that Professor Hunt, taking the idea from the beer pump, had invented an air pump to be attached to the water pipe which only costs four or five dollars and has sufficient force for the continuous-gum furnace.

Section 2. Dr. L. Ottofy, chairman, "Dental Education, Literature and Nomenclature," was next called.

Dr. Ottofy reported first on the number of dental colleges. At the time of the last report from this section in 1892, there were thirty-nine. This number has been augmented to forty-six in two years, two of which, however, have been discontinued, leaving forty-four dental colleges in actual operation. Two thousand eight hundred students have matriculated, of whom two thousand six hundred have been in attendance and six hundred have been graduated.

The National Association of Dental Faculties has been the source of marked development and advancement in the standard of the colleges, and but one dental college, as far as known, now continues the traffic in dental diplomas. Necessarily all do not have the best possible equipment or the best of teachers, but all recognize that they cannot attain to prominence or maintain their standing unless they enforce the rules laid down by the National Association of Dental Faculties. Credentials from foreign schools are scrutinized with the utmost caution and the rule is enforced that foreign students must acquire our language.

The subject of dental education was exhaustively treated at the Columbian Dental Congress and at the Twent-first International Medical Congress in Rome, and many points were raised that are worthy of investigation.

In handling the large number of students in some of the colleges by sections and sub-sections, it is impossible that full justice should be done to each and every individual. In the extracting rooms a student has perhaps but one or two days' actual practice. The subject of either limiting the classes or enlarging facilities is one of great importance. A student may well ask if it was the right thing to admit him when it was not possible to furnish him with clinical material. It has been suggested that students be given the privilege of practical work under the tutelage of competent practitioners, but this is not always feasible. The custom of changing from one school to another, during a student's course, is to be condemned, as schedules are not uniform and some points may be lost entirely. It is best to select a good school to begin with and to finish there. As to the question of undergraduates being permitted to practice between sessions, this is an evil that is hard to contend with and that is not within the control of the colleges, but the schools should exert a wholesome influence in this direction. The schools should demand that a student, before matriculating, sign the code of ethics; this would exert a great restraining influence. It would be well if every student, before matriculating, should have to sign a statement that he had not been practicing in violation of the code of ethics for two years before matriculation; that he had not been engaged in any office so conducted, and had not had any interest, financial or otherwise in any office, institution, or practice of that nature, and that he had not violated the dental law of any State during that period, and, *secondly*, that he agrees from the day of matriculation to the day of graduation to govern his conduct by the code of dental ethics, to obey the dental laws of his State and not to engage in unlawful practice, and that any violation of this contract would entitle the college to remove his name from its records and to so report to other colleges, and *thirdly*, that a diploma shall be held only during good behavior; that the college have the right to cancel it for any unethical professional conduct. All this to be signed in due legal form. Such a contract as this would draw a much better element to our colleges and would exert a most wholesome influence on the whole dental fabric.

The report considers this a most propitious time to introduce improvements and reforms tending to elevate professional standing. The first vital demand is a change in the qualifications for admission to a dental school. To allow each school to be the judge of the individual fitness of the candidate is a faulty method. The lowest requisite should be the degree of Bachelor of Art or its equivalent obtained from a reputable university. The school term should also be extended to nine months each, for four years.

The national organization of the teachers of technics is a very important step. This feature, introduced by Dr. G. V. Black, is most important in the education of the dental student.

The system of post-graduate instruction has proved very beneficial in improving the older practitioners who had not the advantages of college education and in improving graduates in special branches. It is greatly to be regretted that the adoption of a uniform system of dental nomenclature did not result, as was hoped for, from the World's Columbian Dental Congress. A better means of popular education is an imperative demand. This should be parcelled out in small doses, by means of slips adapted to the case in hand, giving just the information needed, but not trying to teach it all at once. The section had hoped to submit reports from many local societies, and as a sample of what was desired, submitted a report from the Washington City Dental Society as a model.

In the discussion of the topics introduced in this report–

DR. FRANK ABBOTT thought that the proper place for reform, in the time devoted to dental education, was at the beginning rather than at the end of the term. He was in favor of raising the requirements for admission to the school rather than extending the time for technical study.

DR. ST. GEORGE ELLIOT said that in education *per se*, England was decidedly ahead, though in technical skill the American dentist was far ahead. He thought Dr. Abbott had hit the nail on the head in what he had said as to the necessity of more thorough preliminary education and a higher standard of admission to the technical schools.

DR. W. H. MORGAN said that success in the practice of dental surgery depends largely upon technical skill. You may give a man all the collateral science you choose, but without technical skill he will not be a competent dentist.

DR. FRANK ABBOTT: The fact of a thorough preliminary education does not preclude the possession of practical skill. The better a man is educated the better professional man will he make.

DR. BOGUE called attention to the fact that in Austria a man had to complete a seven years' course in medicine before he could take up dentistry, and for that reason there were no good dentists in Austria. A man needs to acquire his technical skill while he is acquiring his theoretical education.

In Italy no man can study medicine till he has graduated in literature, and he cannot study dentistry till he has graduated in medicine. He must take the degree of A.B. before he can get the M.D., and he must take the M.D. before he can get the D.D.S. Time is not counted in the old countries and a man would be forty years old before he was prepared to do anything in dentistry, but here every moment counts. A young man begins at eighteen and in three years he expects to begin to do something for himself. He cannot wait till he is thirty or forty years old before he begins to serve his fellow men. At eighteen or twenty he is prepared to enter a professional college and at twenty-one, two or three he is ready to earn his living and to render good service in his chosen profession.

Dr. J. N. Crouse: In regard to practicing before graduating, I think every man should be given a chance to find out what he is fitted for as early as possible, and if he is not fit for it let him find it out early and try something else. A man does not want to spend three or four years in learning something he is not adapted to. The college faculties know that many of their students will never make dentists. Then let them try and find it out, so that they can quit in time and go at something else.

Dr. J. Taft: That would perhaps be an advantage to the undergraduate and not hurt him, but how about his patients? It takes but a few years to complete the curriculum and before it is completed he is deficient in many lines, especially when a graded course is followed. A man should be as thoroughly equipped as possible before he is allowed to practice at all. He has the opportunity in a well regulated college to test his abilities under competent supervision and direction. It is wrong to encourage the idea of an undergradute starting out alone. He may attain a moderate degree of success—some people are easily satisfied—and then the chances are that he will never complete his course, but will spend the rest of his time making money and believing that he is doing as well as others. A properly planned course should be followed to the end. Those in charge should do their best to give him the best possible equipment before they sanction his going out to practice. The influence of the contrary practice is prejudicial to the profession.

Dr. Morgan: I admit that the broader and more thorough is man's education—all things being equal—the better qualified he is to serve those under his charge. But after all, manipulative ability is the keystone in the arch of dentistry. We cannot do without that. One point in the paper I must refer to—the idea that a young man who, by some mishap through lack of advantages or of proper information, has been led into quackish practice, must never be admitted to a dental college. According to my faith there is no sin that cannot be pardoned through repentance and reformation. If the young man finds out his mistake, if he proposes to rectify the error of his ways, we should take him by the hand, encourage him, lift him up out of the slough of despond. Many of our best men picked up their first ideas in the shop of some "Cheap John;" I do not understand what is meant by the phrase *thoroughly qualified.* A man would never begin to practice if he had to wait till he knew it all first. The schools, through their laboratories and clinics, teach all who have any practical ability what they have to do in a successful practice. If not, they fall short of their duty.

Prof. Truman favors preliminary education that enables a man to profit by the teachings in the professional schools, but would not have a man devote all the best years of his life to it. After a certain age he cannot acquire the manipulative ability necessary to make him a good practical dentist. We do not want the standard of Europe in America.

Dr. F. Abbott followed in the same line of thought with Drs. Morgan and Truman. A dentist if not practical is good for nothing. A minister is good for nothing if he cannot preach. A lawyer is good for nothing if he cannot make a speech. A physician is good for nothing if he cannot, once in a while, cure a patient, and so with a dentist, he is good for nothing if he cannot use his hands. In the old countries the system of education is such that a man is old before he begins his professional life, and so it is that in Germany, France, Italy, Austria, their dentists lack that genius of manipulation that the American dentist is endowed with.

Dr. Bogue: The reason for this is that in a republic every man is as good as the best if not a little better; but in Europe a man who labors with his hands is degraded by it. Dr. Bogue said that his own preceptor taught him first of all how to use his fingers and he honored his memory; he was taught in the little material details of every day work. Manual and intellectual training must go hand in hand.

Dr. Taft: Any man belonging to a profession should be fitted to occupy a respectable place in the intellectual world.

More than half of the men who ten years ago were known as good practical dentists were deficient in a knowledge of their native tongue. I know, from my correspondence, that they could not write a respectable page, not a composition on theory or science, but a simple English letter of a dozen lines. I have been made to blush for the ignorance of men who were practicing dentistry; there is no excuse for this. A respectable common school, or even grammar school education can easily be attained before the age of sixteen or seventeen. Young men are coming out now by the thousands at the age of sixteen, with a good degree of attainment. It is within the reach of all and *it should be required.* Because a few have not had these advantages they should not be permitted to weigh down the whole profession. I speak of a reasonable basis of elementary education. I do not include Latin and Greek and the higher mathematics, though the few men who have had these advantages stand head and shoulders above those who have been less favored. The young man who has been trained in mathematics and the languages is the better prepared to understand the special studies of our own curriculum. A knowledge of the languages from which our own has been built enables us better to understand our own in all that pertains to it. It is not simply a matter of dogged memory, it is a knowledge of the principles underlying its structure. Knowledge of this kind will not, can not interfere with a man's technical abilities. But if he follows the plow till he is thirty or forty years old he will never acquire the technical ability required in dentistry. But all have not the same natural skill in finger-craft; some, whether educated or ignorant, take it up rapidly, some are naturally slow and some are quick. Manipulative ability does not depend upon education.

DR. JNO. S. MARSHALL: I agree in the main with what Dr. Taft has said, but I go a step farther, a long step farther. It stirs up a feeling of indignation to hear gentlemen on this floor—gentlemen who are members of college faculties—decrying a liberal education as disqualifying men as students of dental science. It seems to me if we would have dentistry on an equal standing with other liberal professions it must be on the basis of scientific attainments. Who are the men who write the text-books we give our students? They are the men who have gone though college, who have then studied medicine, and have then studied dentistry—they are the men who write our text-books! Dr. Taft knows very well that many men who are "good dentists" write papers that have to be very much *fixed up* to fit them for publication. If they had had a liberal education that would not be so, and they would be none the less *good dentists.* It has been said that the colleges should devote more time to practice and less to theory? But the only place to get any theory is in college. A man will not study theory when he gets out of college and gets into practice if he has not studied it in college; but the best practice is that which has theory and science underlying it.

PROF. TRUMAN: My observation does not agree with that of Dr. Taft, that the average dentist is an ignorant man. It is perhaps true of Michigan, but it is not true of the Eastern States. I am daily brought in contact with written papers, written for publication, and I do not find in them any proof of that excessive ignorance spoken of. I find that they compare very favorably with papers written by medical men.

DR. TAFT: I did not say that the average dentist *of to-day* was an ignoramus. I spoke of the average dentist of ten years ago. Improvements are being made all the time, and Dr. Truman is helping to remedy the defects. I admit that there is a large amount of knowledge in the East, but we are trying to get a little in the West also, and I hope that in the course of the next century we will get up with the East!

DR. KULP: I have always advocated a higher order of education as essential to the advancement of the profession of dentistry. We must educate in manipulative skill while we are piling it in on the brain.

DR. T. T. MOORE: Not one-third of the men who get through our dental colleges are competent to practice dentistry. It is not the fault of the colleges. With so many colleges there are not enough students of the right stamp to go round. A practical solution of the question would be to have our dental colleges endowed institutions, with good salaries for the professors. Then if they found a student not competent to make a practical dentist, they could dismiss him at once. It is not right to keep a man three years studying for something for which he is entirely unfit. As soon as this is ascertained he should be told so and advised to try something else.

Dr. H. J. McKellops: I was one of the unfortunate ones who had no early advantages. I had to earn the money with which I got my education. I began at the very bottom of the ladder but I made my own way, and I made my mark in the medical college; my specimens are even now to be found in the dissecting room of that college. But how many medical men look for the source of disease in the mouth? How often does the oculist look to see if a diseased tooth is not the cause of the eye trouble? Men have paid five hundred dollars for treatment of ear trouble when it all came from bad teeth. A dentist should be taught fine manipulative work first. Let them start at the foundation. Do not make plasterers and daubers of them, but teach them nice little work at first and they will never forget it.

Dr. B. H. Catching wished to say a word about the negro in dentistry. There is a negro college in Nashville which is sending out negro graduates in dentistry. When they come before the State Boards for license, they show themselves thoroughly up in theory and in the literature of the profession. They pass fine written examinations, but their manipulative powers are defective. One feature not yet alluded to in this discussion is the present elevated social position of the dentist. A few years ago the dentist occupied about the same position socially as the chiropodist, which was due to his general lack of higher education. His present elevated status is due to the liberal education required as a professional man.

Subject passed.

[*To be continued.*]

## National Association of Dental Faculties.

The eleventh annual session of the National Association of Dental Faculties was held at the Hygeia Hotel, Old Point Comfort, Va., commencing Saturday, August 4, 1894; the President, Dr. H. A. Smith, of Cincinnati, in the chair.

The resignation of Dr. J. E. Cravens as Secretary was accepted and Dr. Louis Ottofy, of Chicago, was made Secretary *pro tem.*

The following faculties were represented:

*Baltimore College of Dental Surgery*—B. Holly Smith.
*Boston Dental College*—J. A. Follett.
*Chicago College of Dental Surgery*—T. W. Brophy.
*Harvard University, Dental Department*—Thomas Fillebrown.
*Kansas City Dental College*—J. D. Patterson.
*Missouri Dental College*—A. H. Fuller.
*New York College of Dentistry*—Frank Abbott.
*Ohio College of Dental Surgery*—H. A. Smith.
*Pennsylvania College of Dental Surgery*—C. N. Peirce.
*Philadelphia Dental College*—S. H. Guilford.
*State University of Iowa, Dental Department*—W. O. Kulp.
*University of Michigan, Dental Department*—J. Taft.
*University of Pennsylvania, Dental Department*—James Truman.
*Vanderbilt University, Dental Department*—H. W. Morgan.
*Louisville College of Dentistry*—F. Peabody.
*Southern Medical College, Dental Department*—C. V. Rosser.
*University of Tennessee, Dental Department*—J. P. Gray.
*University of Maryland, Dental Department*—F. J. S. Gorgas.
*Royal College of Dental Surgeons of Ontario*—J. B. Willmott.
*Columbian University, Dental Department*—H. C. Thompson.
*Northwestern University Dental School*—G. H. Cushing.
*American College of Dental Surgery*—Louis Ottofy.
*National University, Dental Department*—J. Roland Walton.
*College of Dentistry, University of Minnesota*—T. E. Weeks.

The following schools were admitted to membership during the meeting:

*Western Reserve University, Dental Department, Cleveland, O.*—H. L. Ambler.

*Western Dental College, Kansas City, Mo.*—D. J. McMillen.

With reference to the application of Howard University, Dental Department, the Executive Committee recommended that in consequence of changes in and inadequacy of its dental department the application be rejected. The report was adopted.

The report of the Executive Committee recommending the admission of the University of Buffalo, Dental Department, to membership, was amended by the addition of the following clause, and then adopted: "When the honorary degrees conferred on Messrs. Southwick and Howard are returned to the university and revoked, and official notification of such revocation filed with the secretary of this association."*

The amendment to rule 5 offered by Dr. Hunt last year, making the rule read as follows, was adopted unanimously:

"(5.) STANDING OF UNDERGRADUATES IN MEDICINE.—Undergraduates of reputable medical colleges, who have regularly completed one full scholastic year, having attended at least seventy-five per cent. of a five months' term, and passed a satisfactory examination in the studies of the freshman year, may be admitted to the junior grade in colleges of this association, subject to other rules governing admission to that grade."

The following new applications for membership, with their recommendations, were reported by the Executive Committee:

Dental Department, Cleveland University of Medicine and Surgery, Cleveland, O. Recommended by Drs. J. Taft and J. E. Garretson.

Cincinnati College of Dental Surgery, Cincinnati, O. Recommended by Drs. James Truman, T. W. Brophy, F. J. S. Gorgas and J. A. Follett.

Birmingham Dental College, Birmingham, Ala. Recommended by Drs. H. W. Morgan and C. V. Rosser.

University College of Medicine, Dental Department, Richmond, Va. Recommended by Drs. F. J. S. Gorgas and H. W. Morgan.

Atlanta Dental College, Atlanta, Ga. Recommended by Dr. H. W. Morgan and the Faculty of the University of Tennessee, Dental Department.

The amendment to by-law 4, which was offered by Dr. Hunt last year, was laid on the table.

The resolution offered last year by Dr. Sudduth, directing the

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*The Dental Department of the University of Buffalo complied with these conditions on August 13, 1894, and is therefore admitted into full membership.—LOUIS OTTOFY, *Secretary*.

addition of Latin and physics to the entrance examination, was also laid on the table.

The special committee appointed last year to consider the matter of the vote of censure passed upon the Baltimore College of Dental Surgery reported, through its chairman, Dr. C. N. Peirce, recommending that no further action be taken. The report was adopted.

Dr. Louis Ottofy offered a recommendation, which was adopted, that all colleges, members of this association, shall increase the college course of 1895-6 to not less than six months.

The following resolution from the Executive Committee was adopted:

*Resolved*, That any college or colleges making application for membership in the National Association of Dental Faculties shall be required to secure and present to the Executive Committee the approval and indorsement of the Board of Dental Examiners of the State (where such boards exist) in which such colleges are located, before their application can be considered.

The following from the Executive Committee was laid on the table:

*Resolved*, That we regard it as inconsistent for any member of a faculty of any college holding membership in this body to, at the same time, be a member of any State Board of Dental Examiners.

The report of the *ad interim* committee, with reference to charges preferred against the University of Maryland, Dental Department, was referred to the Executive Committee, which reported as follows:

"Your Executive Committee respectfully report that they find that the University of Maryland, Dental Department, in the reception of certain students did violate the regulations of this association, through a misapprehension of the rules, as it is interpreted by your committee that the regular sessions of all colleges close with their commencement exercises."

The report was adopted.

Dr. Guilford moved that rule 11, p. 12, of the "History" be understood to mean that students coming from a college not a member of this association will not be given credit for any time spent in such institution.

The annual dues were increased from $3.00 to $5.00, on motion of Dr. Cushing, the increase to take effect in 1895-6.

On motion of Dr. Truman, the special committee on preliminary examinations was instructed to have prepared by a competent person and present at the next annual meeting a list of questions of a standard covering every branch required in the grammar schools up to the point of admission to the high schools.

On motion of Dr. Abbott, it was ordered that each college should each year present its announcement, noting any changes, the secretary to note and publish all important changes in the annual report of the association.

On motion of Dr. Morgan, all the schools were required to comply with the rule regarding dissections.

On motion of Dr. Ottofy, a committee of three was appointed to revise the constitution and by-laws, with the further instruction, on motion of Dr. Truman, to drop the qualifying term "by."

The following were introduced, and under the rules lie over till next year:

By Dr. Peirce:

*Resolved*, That, in view of the recommendation of the Executive Committee, this association will require that all colleges, members of this association, shall extend the term of the session of 1896-7 and of succeeding sessions to not less than seven months each.

By Dr. Truman:

*Resolved*, That on and after the session of 1898-9 the regular session of each of the colleges belonging to this association shall be extended to four years.

By Dr. Ottofy:

Beginning with the session of 1896-7, the examinations conducted by the colleges of this association shall be in the English language only.

By Dr. Ottofy:

Beginning with the session of 1895-6, no college shall be permitted to retain membership in this association if it is conducted or managed, in whole or in part, by any person or persons who do not practice dentistry in accordance with well-recognized and generally accepted forms, generally known as dental ethics, or if they are owned in whole or in part by men or women who are engaged in disreputable dental practice, or if any college have upon its list of trustees, the faculty, demonstrators, or in any other capacity, any one who does not practice dentistry in accordance with the principles above mentioned. This shall refer to dentists only.

By Dr. Ottofy:

Beginning with the session of 1896-7, the following shall be the requirements for the admission of students to the colleges of this association;

*a.* A certificate of having successfully completed at least one full year's course of study in the collegiate department of any college or university registered by the regents of the State of New York as maintaining a satisfactory standard.

*b.* A certificate of having passed, in a registered institution, examinations equivalent to the full collegiate course of the freshman year, or to a completed three years' academic course.

*c.* Regents of the State of New York pass cards for any forty-eight counts.

*d.* A certificate of having passed the matriculation examinations of any university in Great Britain or Ireland, or of having completed a course of study recognized as an equivalent therefor.

*e.* A certificate of graduation from any registered gymnasium in Germany, Austria or Russia.

*f.* A certificate of the successful completion of a course of five years in a registered Italian *ginnasio* and three years in a *liceo.*

*g.* The bachelor's degree in arts or science, or substantial equivalents, from any registered institution in France or Spain.

*h.* Any credential from a registered institution, or from the government in any foreign State or country, which represents the completion of a course of studies equivalent to graduation from a registered New York high school, academy, or from a registered Prussian gymnasium.

By Dr. Gray:

*Resolved,* That law 7 of the by-laws, which now reads "attendance upon three full courses of not less than five months each in separate years shall be required before examination for graduation," be amended by substituting "six" instead of "five," to take effect on and after the year 1896-7.

By Dr. Willmott:

*Resolved*, That at least twenty-nine months intervene between the beginning of the freshman year and the date of graduation.

The Committee on Text-books presented the following report, which was adopted:

Your Committee on Text-books would report that only two works of this character have been presented for its consideration:

One, a work on "Dental Anatomy and Pathology," by Dr. C. F. W. Bodecker, of New York, 700 pp.; and the other, a smaller and less pretentious work of about 75 pp., on "Operative Technics," by Dr. Thomas E. Weeks, of Minneapolis.

Both of these works are in press and nearly completed. The treatment of their subjects is full, clear and concise, and the illustrations numerous, well executed, and for the most part entirely new.

Your committee would therefore recommend these two works for indorsement as text-books.

Suitable resolutions regarding the death of Drs. R. B. Winder and W. H. Eames were presented and adopted, and the secretary was instructed to communicate a copy to their respective families.

The following officers were elected for the ensuing year: Frank Abbott, President; S. H. Guilford, Vice-President; Louis Ottofy, Secretary; H. W. Morgan, Treasurer; J. Taft, B. Holly Smith and Thomas Fillebrown, Executive Committee; James Truman, Truman W. Brophy and Francis Peabody, *ad interim* committee.

Dr. Abbott, the newly-elected President, was installed, and appointed the following committees:

Committee on Schools—J. A. Follett, F. J. S. Gorgas, Louis Ottofy, C. N. Peirce and Truman W. Brophy.

Committee on Text-books—J. D. Patterson, A. O. Hunt, J. B. Willmott, T. E. Weeks and J. P. Gray.

Adjourned.

The above report we have by the kindness of Mr. Hise of the Dental Cosmos.

# SELECTIONS.

## Why are We Weary?

Work and want of work, bring weariness. Hot haste and hot rooms bring fatigue. There are moral causes and there are physical—the moral produces the physical. But why do these do so? Dr. Hodge, of Clark University, has been for some years making experiments with a view of elucidating the pathology, or explaining the physiology, of fatigue. He refers to the fact that all the energy of the body comes directly from chemical changes and reactions in the individual cells of which the body is composed. If we could know the processes which take place in a single nerve cell, it would be the key to the whole of nerve physiology, from the action of the nervous mechanism in the protoplasm of the amœba, and thence through the entire animal series, to the activity of the human brain. It has been well known that every kind of cell has its peculiar function—gland cells to secrete their own fluid, the cells of muscle to produce work, whereas nerve cells produce what we call consciousness—a thing outside of physical observation.

But the nerve cells have the same life-history of birth, maturity, and death, as other cells; hence they suffer from want of nourishment, fatigue, and in the struggle for existence.

Dr. Hodge has been trying to find out what changes occurred in the cells of healthy animals, by passing electric currents through them. Various animals were used for this purpose, and after they were killed the nerve cells were examined under the microscope.

Some of the animals were put under the influence of ether, and a mild current carried directly to the one side of the optic thalamus and other sections of the brain, and after a time the animal was killed and opposite sections made and examined. The results of a large number of experiments exhibited a uniform diminution and decrease of the size of the nucleus of the cells, which had been subjected to the stimulation, and a change from smooth and round to jagged, irregular outlines. The recticular appearance was broken up, the cell protoplasm was shrunken in size, and the nuclei were decreased in size. The sections of brain not stimulated showed no changes of this nature. Great care was taken that the electrical current should be within physiologic limits. This inquiry followed: Do similar changes occur in the normal activity of an animal from fatigue? and are they restored by rest and sleep? To answer this numerous sparrows, pigeons and swallows were shot in the morning, as they were going out, and at night when coming home after a day of activity. Sections of similar parts of the brains of the morning and evening birds were compared with each other. In all cases the brain cells of the birds at evening were greatly decreased in size, and the nucleus jagged and of irregular outline. The cell protoplasm was also shrunken and reticulated in appearance. The nuclei were also greatly decreased. Honey bees were caught coming out of the hive in the morning and compared with the bees going in late at night. The same differences were noted in the brain cells, showing degrees of exhaustion and fatigue in one, and vigor and health in the others.

These studies, conducted with great accuracy and detail for the purpose of eliminating all errors, seem to point to brain and nerve fatigue as a shrinking of the nucleus and cell protoplasm. Birds indentical in appearance, shot at night and in the morning, brought out this fact, in the shrunken cells at night, and the full rounded cells in the morning. The conclusion is that in sleep the wasted cell recovers its functional changes from fatigue, and the failure of this restoration is the beginning of organic degeneration of all forms and degrees. The cell recovers the bundles of nerve fibers which enter into it, and are lost in the granular substance and nucleus. Here all the impressions of the external world come in a succession of impulses, and all the outgoing commands are determined.

Something like this decreased and shrinking of cell contents and nucleus are common in old age. It would appear reasonable to suppose that failure to restore the cell contents would be ageing and practical starvation of the body. If physiological fatigue is functional changes in nerve cells which can be restored by rest and sleep, scientific inquiry has taken a step forward of deep significance.

Dr. Hodge has been for some time making studies of the changes which take place in nerve cells under variations of food and water supply. Also what changes if any take place in nerve cells from birth to death from old age, from rejuvenation to senescence. These researches will be watched with much interest.—*The Popular Medical Monthly.*

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## The Value of Sugar and the Effect of Smoking on Muscular Work.

As the result of a series of experimental researches in the Physiological Institute, Turin, as to the value of sugar and the effect of smoking on muscular work, Vaughan Harley (*Journal of Physiology*, vol. xvi, Nos. 1 and 2, March, 1894) has come to the following conclusions:

1. The periods of indigestion as well as the kinds of food taken have a marked influence on voluntary muscular energy.
2. Irrespective of the influence of good, there is a periodical diurnal rise and fall in the power of performing muscular work.
3. More work can be done after than before midday.
4. The minimum amount of muscular power is in the morning about 8 A. M., the maximum about 4 in the afternoon.
5. Regular muscular exercise not only increases the size and power of the muscles, but has the effect of markedly delaying the approach of fatigue.
6. The amount of work performed on a diet of sugar alone is almost equal to that obtained on a full diet, fatigue, however, setting in sooner.
7. In fasting large quantities of sugar (500 grs.) can increase the power of doing muscular work during thirty voluntary contractions from 26 to 33 per cent. while the total gain in a day's work may be 61 to 76 per cent., the time before fatigue sets in being also lengthened.

8. The effect of sugar is so great that, when added to a small meal, it can increase the muscular power during thirty contractions from 9 to 12 per cent., while the total increase in work may be from 6 to 39 per cent., the approach of fatigue being at the same time retarded.

9. When added to a large mixed meal sugar can increase the muscular power of thirty contractions 2 to 7 per cent., the increase in total work being 8 to 16 per cent., and a marked increase in the resistance to fatigue is shown.

10. Two hundred and fifty grammes of sugar taken in addition to a full diet increases the day's work; the work accomplished during thirty voluntary muscular contractions shows a gain of from 6 to 28 per cent., the total day's work giving an increase of power 9 to 36 per cent., and the time before fatigue sets in being lengthened.

11.* Moderate smoking, although it may have a slight influence in diminishing the power of doing voluntary muscular work, neither stops the morning rise nor, when done early in the evening, hinders the evening fall.

12, Sugar taken early in the evening is capable of obliterating the diurnal fall of muscular power that occurs at this time, and increases the resistance to fatigue.

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## Chloroform Anæsthesia without Danger.

BY FRANK H. PRITCHARD, M.D.

Dr. G. Maurange (*La Semaine Medicale*, No. 27, 1894) recommends the subcutaneous injection of the following solution as a preparatory and prophylactic measure before administering chloroform:

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|---|---|
| Neutral sulphate sparteine (grs. ivss). | 0.30 |
| Muriate morphine (grs. jss). | 0.10 |
| Sterilized water, ad (ʒijss) | 10 ccms. |

Inject 1 ccm. of this solution a quarter of an hour before administering the anæsthetic.

Out of 106 operations where chloroform was employed with preliminary injection of this cardiac stimulant, not a single disagreeable symptom was observed, however long the subject was under the anæsthetic. The period of excitement was suppressed and the absorption of the anæsthetic was reduced to a minimum on account of the morphine.

(The employment of a preliminary injection of atropine with morphine has been known for quite awhile. I have not much confidence in atropine as a heart stimulant, and believe that its use is limited to a peculiar state of the heart, but would rather confide in nitro-glycerine with or without digitaline or digitalis, sparteine or strophanthus, in the prevention of disagreeable accidents in chloroform anæsthesia, as well as that of cocaine. I have full confidence in nitro-glycerine as a rapid heart stimulant, either alone or combined with digitalis. A recent German writer, in writing on the physiological antagonism of drugs, states that digitalis is the specific antidote for chloroform. He begins a day or so before the operation and administers the drug so that the system be well under its influence, and has by this method succeeded in doing a large number of operations under chloroform without the slightest accident. Sparteine also has the advantage of acting quite rapidly, yet not so quickly as nitro-glycerine or amyl nitrite—another antidote for heart failure under chloroform. In painless extraction of teeth I have found the addition of a few drops of an alcoholic solution (1:100) of the drug to a ½ per cent. solution of cocaine with carbolic acid to give the best of results, yet with the same preparation without the nitro-glycerine I have in at least half the cases observed either slight or pronounced symptoms of cocaine intoxication. Not too much of the stimulant is to be added, or the effect of the cocaine will be more or less antidoted and the anæsthesia will be imperfect or lacking. The formula given in a recent number of the *Lancet-Clinic* I have found to contain too much nitro-glycerine. Five to ten drops to the ounce are sufficient, in my opinion. The technique also requires careful study. It is dangerous to use the secret preparations, for no one knows how much cocaine they may contain; some persons have a curious idea of the lack of power of the drug. —TRANS.)—*Cincinnati Lancet-Clinic.*

## The Healthiest Capital in the World.

Judged by its death-rate the health of London compares most favorably with that of any other large city, at home or abroad. The recent weekly statistics of the Registrar-General show that the metropolis is now remarkably healthy, and the death-rate almost the lowest on record. During the last four weeks, for which returns are available, the London mortality has been equal to an annual rate of only 16.3 per 1,000 persons living, while in Paris it was 20.5, in Berlin 18.2, in Vienna 22.5 and in New York 19.6. The death-rate in London is now considerably lower than in any foreign city containing a population of half a million or upward ; and with one or two exceptions actually lower than in any other of the thirty-one large colonial and foreign cities for which returns are published by the Registrar-General. On only three previous occasions on record has the London death-rate been so low as during the current month, and in every week since January last the deaths have been considerably below the average. Although during the quarter just ended the mortality from the principal zymotic diseases in London has exceeded the average, owing to the prevalence of measles and diphtheria, the meteorological conditions have generally been unusually favorable to the public health. The mortality from diseases of the respiratory organs has been considerably below the average each week throughout the quarter, and the cool weather has delayed the appearance of summer diarrhea, which invariably causes a rapid rise in the death-rate about this period of the year.—*British Med. Journal.*

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## The Title of Professor.

In German universities the teaching body is divided into three classes. The aspirant to a professorship receives the *venia legendi* under the name of *Privatdocent.* Above him is the professor extraordinarius, and on the highest rung of the ladder there is the professor ordinarius, who is eligible for the deanship of his faculty and for the rectorship of the university. The title of professor being a much coveted one in Germany, the government has from time to time bestowed it on men of special merit; either *Privatdocenten*, for whom no professorship could at this moment be found, or other distinguished men not connected with the university. This government favor, by the way, has the additional merit of cheapness, as in such cases the title is purely honorary, no remuneration being attached to it. Of late, quite a shower of these titular professorships has fallen. The Prussian Cultus Minister has bestowed it on a number of *Privatdocenten*—doctors of medicine for the most part—without first consulting the faculty (the body corporate of university teachers). No wonder that a certain amount of discontent is felt in university circles. There is every reason to believe that, had the faculty been asked, they would have advised the promotion to a real professorship in some cases, and in others would have considered the scientific work of the claimants hardly such as could justify the preference.—*Berlin Cor. British Med. Journal.*

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When your broach fails to take and wind cotton perfectly, draw it a time or two through a once-folded piece of fine sand-paper.

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# NOTICES.

## New England Dental Society.

The thirty-second annual meeting of the New England Dental Society will be held in Hotel Clarendon, Tremont St., Boston, Mass., Thursday and Friday, November 8th and 9th, 1894, beginning Thursday afternoon at one o'clock.

It is requested that all members of this Society make an earnest effort to be present, as the meeting promises to be of unusual interest. EDGAR O. KINSMAN, D.D.S.,

*Secretary.*

# EDITORIAL.

## Tri-State Dental Meeting.

At the last annual meeting of the Ohio State Dental Society a resolution was offered proposing a joint meeting of the Ohio, Michigan and Indiana State Dental Societies to be held at a time and place to be fixed.

A committee of three was appointed to confer with similar committees that might be appointed by Michigan and Indiana. At the last annual meeting of these two States the subject was presented and the committees as contemplated were appointed. After some conference, by correspondence, these committees designated Old Point Comfort, and the 6th of August, as the place and time for their meeting. At this time a majority of each committee was present.

They were called together and took into consideration the question of holding such a meeting, after which it was unanimously decided that it was not only feasible but very desirable that such a meeting be held. The time fixed for it was the third Tuesday in June, 1895, the place selected was Detroit, Mich.

A committee of one from each State was appointed to constitute an executive committee. Dr. L. L. Barber, of Toledo, was made chairman of that committee; the other members were Dr. J. Ward House, of Grand Rapids, Mich., and Dr. G. E. Hunt, of Indianapolis, Indiana. A local committee was appointed to make arrangements for the accommodation of the meeting; Dr. George L. Field, of Detroit, was made chairman of that committee.

From the interest manifested by all those to whom this matter has been presented, it is very certain that a large and interesting meeting will be held.

A report of the progress of the various committees preparatory to this meeting will be given in the pages of the REGISTER from time to time. In the meantime communications in reference to it may be sent to Dr. L. L. Barber, of Toledo, or Dr. George L. Field, of Detroit.

We trust that there will be not less than one hundred members from each State, and two or three times that number if possible.

THE DENTAL REGISTER.

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# COMMUNICATIONS.

## Syphilis.

AN AUTOBIOGRAPHICAL SKETCH.

BY W. H. WHITSLAR, M.D., D.D.S., CLEVELAND, O.

Read before the Northern Ohio Dental Society, June, 1894.

After being called the disease of the French, German, Poles, Turks, Spaniards, Neapolitans, and others, in which each nation tried to have another stand as sponsor for me, I received my name in the sunny clime of Italy. I was already hundreds of years old and my friends were scattered all over the world. Previous to this my guardians had failed to give me a name, although I am the daughter of Prostitution.

I was named after a herdsman of King Alkithous, Syphilis by name, who, having offended Apollo, the god vested his vengeance by giving me to him, at least, Fracastor, in a Latin poem in 1530 A. D., gave this history to the world.

The word syphilis descends in a direct line from the Greek, "with" and "love," the companion of love, meaning that the disease is transmitted by intimate relations.

The history of my career has been one of contention. I have lived in all parts of the world and visited all nations.

From the fact that I have appeared in different forms of disguise, I have been unrecognized by many, until I threw off the mantle, and the flaming signs of my virulence became cognizable. Even now the dress I wear may have different colors. I am partial to a red or copper color, and these fringed with blue or gray dominate my dress.

These colors may be evidences of my presence and liability to remain for a time, for I have a peculiar habit which in man is a virtue, in me a curse, namely, perseverence. I form intimate acquaintances and never leave them, although at times our lines are separated somewhat, because my light is kept under a bushel. By men I am introduced to their beautiful wives, and even become a part and parcel of their children. I am truly sorrowful to kill these poor little innocents, very often before they are born or soon after, but it is only the logical sequence of that persevering habit of adhering to those who seek my company, and fulfilling the old adage that the sins of the fathers shall be visited upon their children.

Misery loves company. My life has been one full of misery. I have seen thousands of people die and nations cursed in my presence, whilst I have survived. Though I have been said to be five thousand years old, I at times have tender feelings and need nursing. I have myriads of nurses. As a rule they are unfit to give me comfort, because they try to get rid of me. Perhaps this is because I am repulsive to many. My life is repugnant to me also, although I live in freedom in kings' palaces, and have seared the names of dignitaries of church and monastery, monks, nuns, etc., as well as to degrade the poor slave. My home is constantly being moved from one place to another. My personality is an enigma. Some authorities claim that I am a poison existing in the blood which I infect. Others devise that I am an individual germ capable of propagating my own species. This is not definitely settled. However, Lustgarten in 1884 described an S shaped bacillus found in tissue and discharges of syphilitic ulcers, but he was unable to cultivate it. It has been found in the blood by other observers. That I do poison men, I cannot deny. That I can race with unmeasured speed in flowing currents of blood and secretions is my delight. As yet no man has captured and pinned me to the walls of his dark museums. In these catacombs traces of my wrath may be seen. It is a fact, which may be recalled that in the Stone age my existence then is now proven by the marks of exostoses that I left upon the bones of man. Teeth also bear characteristic deformities. Broca, Ollier, Parrot and Virchow, have witnessed these results.

I am therefore prehistoric. Men have even suspected that I have existed since man was created.

Undisputed evidences chronicle my presence in China 2,637 years B.C., by the writings of an emperor, Hoan-Ti, who lived at that time. My cradle seems to have been rocked in India. The Aryans, a Sanscrit-speaking people of India, whose ancestors came from Central Asia, peopled Persia, Palestine, Arabia and Egypt, caused my virus finally to spread over Europe. I have visited the islands of the sea and also appeared in America before it was discovered by Columbus. Evidences of Peruvian subjects of this disease before Europeans made use of iron are well known.

Further history of my existence would require pages of print to complete it.

I will now mention two of my most prominent characteristics.

Most flowers have perfumes. Some are noted for their delicate odors, others are not so pleasant. Unfortunately, I am like the flowers with the disagreeable odor. It is said that once the smell from my breath penetrates the Schneiderian membrane of man it leaves a lasting remembrance.

Secondly. I have a monstrous appetite. It amounts to gluttony. I feed upon the vitals of men and women alike. Their blood I render thin, the red corpuscles are dismembered and their coloring matter assist in the syphilides. I feed on brains, oh, what a delicate dish! Many noted men have contributed theirs to appease my appetite. My greed is well described by E. L. Keyes, in the following language: "There is no organ or tissue of the body through which it may not manifest its presence by symptoms, or upon which it may not exercise its power. The lymphatic glands all over the body may suffer, some habitually more than others. The skin from crown to sole, the nails, the hair (the teeth in inherited disease), and the mucous membranes, especially through the natural orifices, have their peculiar affections due to syphilis. The eye and the testicle do not escape, and each and every viscus is liable to be invaded as are all the tissues, connective, fibrous, muscular, cartilage, bone, brain, nerve, and vessel. Not only this, but the all-embracing arms of general syphilis include the functions as well, any of which may be disordered by it, and each and all of the special senses may be perverted or destroyed including the sexual appetite. The symptoms of all the forms of local, special, or general paralysis of motion or sensation may be occasioned by syphilis. Finally, the intellect may succumb. Acute and chronic mania, dementia, lunacy, idiocy, all the above and many more form the catagory of symptoms comprehended under the one term Syphilis."

It is my first essay to destroy the shameful parts, and indeed this is the first salutation to my master, who bought me with a price, and now he becomes *my* slave.

Inherited syphilis has no chancre. Chancre is a term given to a syphilitic primary sore. Although a misnomer, the name is retained by syphilographers to distinguish it from chancre, chancroid, a similar sore having a soft base, whilst the chancre has an indurated base. There are other characteristic differences and the principal one is the edge of the sore, chancre, edge sloping, chancroid undermined.

Chancre has a period of incubation of ten days to two weeks. Chancroid has no incubation. The secretion of the chancroid is purulent and auto-inoculable. Lindnan has inoculated himself 2,700 times at last report with chancroidal secretion. Chancre may have no secretion, or if so, it is serous and scanty. The chancre (syphilitic) is not transferable to animals as is chancroid, and appears but once in a lifetime. Zeigol says he has seen reinfection.

Chancre is followed by a train of constitutional ebullitions. Ricord states that an individual is never free from syphilis if it is acquired. Chancroid is not accompanied by any constitutional syphilitic infection.

The appearance of chancres on extra-genital parts is limited to a small percentage. That they are contagious is evidenced by many facts. Prof. Tarnowski, of St. Petersburg, relates a case of a woman who came under his observation who contaminated 300 men in ten months by primary transmission. Think of the consequences! Yet, the disease is rarely fatal except in the viscera form. "Gonorrhœa," says Keyes, speaking of its consequences, "sends more to the grave than syphilis."

Syphilis may be divided into three stages, i. e.:

*Primary.*—The chancre, lasting from four to six weeks, found principally on the genitals; it may be found on the lips, in the mouth, on the tonsils, or in the pharynx. Dentists should be careful not to inoculate their fingers by wounds from an instrument laden with the poison from a syphilitic sore, or they may do the same by holding an instrument with the lips, fissures in which would permit the poison to penetrate to the deeper tissues. In dental operations the chief source of danger is in the mucous patch. This secretes the intensely contagious substance which may adhere to the instruments, napkins, rubber dam, dental floss, plaster, etc. The disease may be transmitted by tooth transplantation.

The *Secondary* stage may last from two months to a year. It is contra-distinguished from the third stage, by its symmetrical effects. The first and second stages affect the cutaneous parts of the body. The third stage involves the connective tissues.

The cutaneous eruptions are called syphilides (sif-il-eeds), and the following may occur: erythema, papules, vesicles, pustules, bullæ, and gummata and tubercles.

Now, you may ask me "What are some of the manifestations in the mouth of man?"

Naturally our attention reverts to the teeth. Inherited disease, vitiating the blood of the mother during pregnancy, causes a lack of nutrition and proper calcification of, principally, the central incisors and molars of the permanent set of teeth. The incisors are most affected, because of their smaller lobes, these being deficient, especially the central lobe, the mesial and distal ones are melted down, as it were, to conform to the central one, and consequently the mesial and distal angles are rounded, giving the rounded or "peg-shaped" tooth as described by Mr. Jonathan Hutchinson. The central lobe, easily disintegrated, favors the "notched" appearance. A study of the time of development of these will enable one to readily understand why these teeth are affected more than others. Syphilis affects only the permanent set of teeth, as above indicated. Oakly Coles reports peg-shaped teeth in a temporary set. The general debility may reduce the quality of structure in the temporary set. The same expressions of debility will dwarf the alveolar process. Syphilis affects the jaw bones as well as other bones. It must be understood that acquired syphilis may result from syphilitic mothers or nurses, and the full gamut of the disease may be run in the young child, In this event the arrest of development of the jaws may continue so as to have a relative disproportion in the size of the bones compared to the teeth. "Arrest of development of the jaws, however, the result of constitutional diseases, to produce dental deformities, must occur prior to the sixth year."— *Talbot.*

The diagnosis of congenital syphilis is not entirely dependent upon the teeth, for some syphilitics have good teeth.

*Tertiary* syphilis may manifest itself as—

1. Gummatous tumor—nodular diffuse.
2. Periostitis.
3. Ulcers (mostly deep, result in caries and necrosis).

When the third form is found it is usually in the median line either at the junction of soft and hard palate or over the hard palate itself. It may also be found just behind the upper incisor teeth. Mucous patches of the mouth, in either second or third stages, are quite characteristic. They consist of bluish-white elevations of mucous membrane; their favorite location is on the tonsils and soft palate. These should not be confounded with tubercular ulceration. The dentist must beware of mucous patches. Their secretion is syphilitic poison. Unless these or other ulcerations of the mouth are present, saliva or other physiological secretions cannot produce syphilis by inoculation. Profeta, of Palermo, and Diday inoculated saliva without success. Secretions from chancre, mucous patches, and secondary cutaneous or mucous lesion yielding a discharge, and of syphilitic blood taken from patient with eruption, will yield an indurated chancre. Syphilis is sure to follow, even though the chancre is excised a short time after its presence is known, because the virus is readily absorbed. I would conclude this sketch with the language of Lennox Brown.

"The history of the case, the post-cervicle glandular enlargement, absence of sympathetic induration of the parotid, submaxillary or anterior cervicle glands, the comparative freedom from pain, and above all, its amenity to appropriate remedies will distinguish this disease from cancer, the only malady with which it is confounded."

## Local Anæsthetics.

BY L. E. CUSTER, D D.S., DAYTON, O.

Read before the Northern Ohio Dental Society, June, 1894.

From the time that a deep sleep came over Adam, that one of his ribs might be painlessly removed for the well-being of Eve, agents have been employed in a great variety for producing insensibility to pain. Opium and hyoscyamus were used by the ancient Egyptians, and the heroes of Grecian myth produced wonders with hemp. Mandrake produced such profound slumber that a limb might be painlessly removed during its influence, and alcohol still possesses sufficient strength that a man may wake up in the morning with a bruised head and blackened eye and wonder how he came by them.

The whole subject of painless dentistry, including local anæsthetics, has been so exhaustively gone over by the Michigan State Society, just met, that little remains but what would be a repetition of its work, so instead of presenting an elaborate paper upon this subject, we will only touch upon a few of the more vital parts and close with what is known as Infiltration Anæsthesia.

Pain is a necessary safeguard of these bodies of ours and is so interwoven with the motor and special-sense functions of nerves that it can only be overcome with great danger to the vital processes, respiration and circulation. There are many operations in dentistry which involve a small area of sensitive tissue and which are quite painful enough to demand an anæsthetic of some kind, although hardly justifying the risk of a general anæsthetic. Such cases are met by the injection of an agent into the circulation at the point of operation, the topical application to the surface only which is absorbed by the underlying tissue and by refrigeration.

This not being a body of students it is unnecessary to go into methods and appliances as you are all familiar with them, but there is one point I would urge and that is the cleanliness of the needle and mouth. They must be aseptic. It is a recognized fact in surgery that there is more danger of septic poisoning from a puncture than from an open cut. In a hypodermic injection we not only have a puncture, but if we are not careful we have a puncture in a hot-bed of micro-organisms and their products. The needle must be aseptic and the mouth should have been washed with a germicide and disinfectant, none of which is more effective than bichloride of mercury $\frac{1}{1000}$ and peroxide of hydrogen equal parts.

Since the discovery of cocaine for local anæsthesia, there has been no single drug introduced of any marked value. Cocaine has become so popular that it is not only used alone but has become the base of nearly all formulæ for local anæsthesia. No single agent approaches it in potency and at the same time no agent seems to be quite so erratic in its action as cocaine, not as an anæsthetic but in its influence upon circulation and respiration. The needle may hardly be removed before the patient shows signs of syncope, palpitation or dyspnœa. Or on the other hand the operation may have been completed and in the midst of the most promising outcome, alarming symptoms of cocaine poisoning set in. These irregularities of cocaine are generally attributed to the idiosyncrasies of the patient, but it is my belief that quite as much is due to the irregular methods and quantities used in injection. At one time a large quantity may be used with apparently no disturbance whatever, and again a very small quantity may bring on alarming symptoms. To my mind this is easily explained. In one instance the contents may enter into the arterial circulation, when it will be quite as effective as an anæsthetic and produce no immediate signs of poisoning, while in another instance it may mostly enter the venous circulation, by which it is quickly carried from the desired point of action to the heart and lungs, thus transferring the action from the point of injection to the vital centers. If the alkaloid has entered the arterial system, the cocaine poisoning would be shown some time after the injection, while if it enters the venous system, these symptoms almost immediately follow as the result of injection into the arterial system, and is usually of a milder nature, because of greater dilution in the blood. It passes through the arteries and capillaries and is more largely diffused, so that it reaches the heart and lungs in less quantity. If the injection finds way more easily into the venous system it does not pass through the capillary circulation and quickly reaches the vital points in almost the pure state.

The combination of cocaine with other agents, I believe only adds to the danger without making it more effective. We do not know certainly what new agent may be formed by the addition of chloroform, chloral, carbolic acid or alcohol. One of the simplest and best formulæ is that given by Dr. N. S. Hoff:

| | | | |
|---|---|---|---|
| ℞ | Cocaine | gr. ss | |
| | Morphia Sulph. | $\frac{1}{6}$ gr. | tab. 1 |
| | Atropine, | $\frac{1}{80}$ gr. | |
| | Carbolized water, 2 per cent. | gtt xxv | |

Tropacocaine is a recent form for which much is promised. It seems to be an ideal anæsthetic, possessing all the good qualities of the muriate of cocaine and none of the bad.

While a topical application is not so effective as a hypodermic injection, it has an element of safety which recommends it. A heavier per cent. may be used than for injection, and when the membrane has been well dried with the warm air blast this method gives adequate results in superficial operations.

Before the administration of cocaine it is well to fortify the patient. Unlike with the use of a general anæsthetic a systemic antidote may be administered, without combating a local anæsthetic. A cup of strong coffee, or an injection of morphine may sustain the system through any irregularity.

Special attention is to be paid to respiration. If it ceases and the circulation is still going on, no matter how feebly, an agent may be injected into the circulation which will stimulate the respiratory centers; for this purpose an injection of $\frac{1}{10}$ grain strychnine is probably the best. For heart failure, medicaments may be inhaled, and the most effective for this purpose is nitrite of amyl, which paralyzes the inhibitory cardiac centers. An agent may also be injected for heart failure, but since it has to take effect through the circulation of the blood, it is evident that it can only avail in a weak pulse and is of no account whatever if the heart has entirely stopped. For this purpose an injection of ten to twenty drops of the tincture of digitalis is best.

Reduction of temperature is a local anæsthetic of no small importance. Where carefully used it is prompt, safe and effective. As a condition for the perfect performance of nerve function, there must be maintained a certain temperature, which is normal to the organism. If that temperature is lowered, neural activity is lessened and anæsthesia is produced in proportion to the departure from normality, so that it is quite possible to reach a point of complete anæsthesia or extreme numbness. It is not necessary to actually freeze the tissue, as is often done in deep operations. It is much better to operate slowly and repeat the application. A great variety of agents have been used for this purpose, but none are so well adapted for dental purposes as chloride of ethyl.

### INFILTRATION ANÆSTHESIA.

In 1891 the percentage of cocaine in solutions for injection was so low that it became a question as to whether pure water alone would not do as well. Sleich, of Berlin, was first to demonstrate that pure water in sufficient quantity, when injected, acted as a local anæsthetic. Many operators upon finding their cocaine solution exhausted or for other reasons, have since used water alone, with apparently as good results as when injecting cocaine solutions. The experiments of Sleich upon the injection of water for local anæsthesia, which he calls "*Infiltration Anæsthesia*," when reported to the Berlin Medical Society, were accompanied by numerous cases and were enthusiastically received by Professor Virchow and the other members. A report says, "Over and over again this method of infiltration anæsthesia has been employed in hundreds of cases, simply because surgeons prefer infiltration anæsthesia to the anxiety of a chloroform narcosis, the dangers of which stand in no proportion to the importance of the operation."

The injection of pure water is painful and it is not until a minute after the injection that anæsthesia occurs. This is in a measure overcome by reducing the temperature by the ether or ethyl spray. The experiments showed that a number of agents might be used with the water to act as an anæsthetic, without producing irritation. The most effective was solutions of common salt. The various per cents. from two to six were tried, but the two per cent. gave the best results.

In explanation of this phenomena the author says, "The cause of anæsthesia by infiltration is not a simple one, several factors are at work: first, the pressure of the injected fluid and the removal of the blood from the infiltrated tissues. After a properly performed injection, they appear perfectly white. That is, instead of the tissue juices, the foreign mixture is incorporated in all the lymph vessels and areolar spaces, while the blood is gradually forced into the neighboring vessels. But besides this pressure and anæmia of the tissues, temperature plays a prominent part." A low temperature is more effective. Every œdema of the skin would be insensible did not the injected fluid, which causes the pathological œdema, contain the same amount of salt (six per cent.) as the serum of the nervous fluid. If one produces an artificial œdema with other fluids with or without a little common salt, the whole region of the artificial swelling will become insensible and will enable one to operate without causing pain. "This," he says "is briefly the principle of infiltration anæsthesia." When we study the methods ourselves, we find that in order that a nerve can communicate sensation, it must be constantly supplied with an amount of nutrient fluid which is normal to it, it must be in its natural investment and must be of a certain temperature. When the salt solution is injected it takes the place of the blood, so that the normal nutrition of the nerve ending is forced out. The solution differs largely from blood; it is an abnormal surrounding. Again, according as the temperature is lowered the nervous reception and transmission of sensation is reduced.

In all the cases which present to us, he is the safe and wise operator who selects the local anæsthetic most suitable for the case.

If it is one of small depth he will use the least dangerous, a topical application or refrigeration, and only use injection when operating to some depth. The injection of a foreign substance into the circulation is a matter of no small importance and we should see to it that the agent is pure and the needle and membrane aseptic.

## Porcelain Work.

BY J. H. DOWNIE, D.D.S., DETROIT, MICHIGAN.

Read before the Northern Ohio Dental Society, June, 1894.

The working of porcelain, in form in continuous gum plates, has been known to the profession for a great many years, although it has never come into general use. The working of it, by the dentist, however, in the form of crowns, bridges and inlays, is of quite recent date. There is no class of work which interests the profession more at the present day, and it is, without doubt, the coming work in dentistry. The manner in which it has been received, and the grand success which numbers have had with it, are good evidences of this. To be sure, some have failed to make a success of it, and have already thrown it aside; but their lack of knowledge of how, properly, to do the work, in no way condemns it. Because hundreds of dentists put in poor gold fillings is no reason why we should consider that a failure, which has served so grand and noble a purpose. The days when glaring gold is admired will soon cease to be, and the truly artistic operator will endeavor to imitate nature, and replace the lost organs and portions of them with a substance which matches so nearly in color that it can scarcely be detected.

Porcelain crown-work has been practiced for quite a number of years, and, when properly done, is one of the most satisfactory operations in dentistry, to both the patient and the operator. The porcelain crown has come from the old-fashioned pivot tooth, set with a wooden peg, down through various stages, each one being devised to overcome some difficulty with the former. This has led to the devising of the crown fused to a metallic cap, previously fitted to the root, and backed up with porcelain; this is the crown with which we have to deal in this paper. With it we get a perfect adaptation to the root by means of the platinum cap, which prevents the splitting of the roots, prevents the joint from decay, and the washing out of the cement, and strengthens the attachment of the crown. The anterior portion of the band is covered with porcelain of the same color as the facing, so there is no metal showing, and no necessity for cutting off the root far above the gingival margin, and lacerating the gums. It is made with the teeth used for other work, so that no special tooth is required. The backing is fused on to the facing, making a perfect union, so it is not necessary to protect the point with metal, to prevent the facing being broken off. The facing of a Richmond crown being always sure to break off, if not protected at the point with the metal backing, is no reason to suppose that a solid porcelain crown is not sufficiently strong. In the case of the metal-backed crown there is no union between the backing and the facing, the porcelain front being held in position by the two small pins alone, which certainly makes a very weak attachment. By the porcelain process, the backing is fused on to the facing, forming a perfect union, which makes, in the finished case, a solid porcelain crown.

The Logan crown, which has served so good a purpose in the past, is sufficient evidence of the strength of a solid porcelain crown. It cannot be truthfully said of it, that the porcelain is not sufficiently strong, as we have very rarely seen one broken. The porcelain is not the weak point in the Logan crown; the difficulties with it are, getting the proper adaptation, liability of the post to break and the root to split. These may be, in a measure, overcome by banding, but in doing this we present to view a strip of gold across the base of the crown, which at once puts upon it the artificial stamp.

The numerous ways in which the baking of the crown may be modified to fit the special case, and the means which we have at hand for its construction, are great advantages in the porcelain process. A crown may be made from almost any plain tooth, for either metal or rubber-work, or from almost any tooth crown manufactured. The preferable tooth for this kind of work is the flat back tooth, such as is used for bridge-work. The root should be ground off flush with the gums, the tissues being pressed away to allow of its being dressed down as far as possible without lacerating them. As the root enlarges at this point, leaving, when ground off, an overhanging edge, it is necessary to dress it off around its circumference in order to properly fit a cap to it. This can best be done with metallic disks and sharp scalers. The measurement of the root is taken with a small wire, using a small dentimeter to handle it. The wire, when removed, should be cut on the opposite side from the twist and straightened out. Laying this on a piece of platinum (30 gauge), a mark is made to show the exact length. The band is cut a little longer than marked, which allows, when the ends are beveled, for the making of a lap joint.

The soldering, as in all cases of porcelain work, is done with pure gold. The band is fitted to the root, and a cap soldered over the top, the cap being perforated to correspond with the root-canal. The post may be made from almost any kind of platinum wire, but the most suitable material is square iridio-platinum. The end of the wire is flattened with a hammer, a little broader than the space between the pins of the tooth, and a notch filed in each side so that it may be placed between the pins, which are then bent over it. This holds it sufficiently firm without soldering. The tooth or facing with post attached may now be set on in position, and waxed in place on the cap, after which it is removed and the cap filled with an investment of equal parts of pulverized silex and plaster. This when set holds the cap in position to the post, after the wax has been boiled out. The case is now ready for the adding of the porcelain. This material is mixed to a paste with water, and applied with a sable brush. It is built around the anterior portion of the band, and well out on the cap, but not over the pins of the tooth. After the first fusing these pins are filed or ground away, and in the case of a very close bite the facing may be ground away at the point of contact. More body is now added, to give the crown the desired contour, which, when fused, completes the case.

Porcelain bridge-work has much to commend it to the profession. It has no joints to absorb the secretions, and certainly merits the name of sanitary bridge-work. The unsightly gold may be dispensed with in all places except where it is necessary to make an attachment to a gold cap, and with this exception the natural appearance can be almost perfectly restored. No gold cusps or cutting edges are required to protect the bridge teeth, for precisely the same reason that they are not needed in the crown work. The crown already described is used as a support for these bridges, the only difference in its construction being that when intended for bridge-work, after setting it up in wax, it is invested, and the cap and pins soldered. This allows the crown to be set in position without the porcelain backing, and an impression to be taken with modeling compound. A model is run, the bridge teeth are waxed in, and the case invested. After removing the wax, a bar of iridio-platinum is fitted from the posts of the supporting teeth across under the pins of the bridge teeth and soldered in position. The case may then be removed from the investment and the porcelain packing added and fused on. When it is necessary to use a gold cap for the support of a bridge, it is made of an alloy of gold and platina (22 k. gold). This admits of being soldered with pure gold, is quite hard, so that its wearing qualities are excellent, and goes through the heat of the furnace without oxidation. The bar is soldered to the cap, the porcelain added and fused, and the case handled in every respect as when porcelain crowns are used for supports.

Porcelain inlaying is a grand thing in certain cases, and it is much to be regretted that the present existing circumstances do not warrant its being used more extensively. The difficulty with inlaying, is that we have not a suitable cement for setting. There is no doubt that sooner or later we will have a cement suitable for this purpose, which will make this the ideal filling. The best method we know for making them is to burnish platinum foil over and into the cavity, thus forming a matrix into which the porcelain is built and fused. Body may be added and fused two or three times until the required contour is obtained. The platinum is then peeled off, and retaining points or grooves cut into the porcelain with the edges of a diamond disk, also undercuts made in the cavity, when the piece is ready for cementing in. The mistake is often made of taking too small a piece of foil with which to make the matrix. This should be large enough to hold easily in position with the thumb and finger of the left hand, while it is being burnished into the cavity with the right. This overlapping foil, by which the matrix is handled, is left on during the process of baking. There are two principal points wherein lie the secret of having a good fit with an inlay: First, in making the walls of the cavity beveled outward for a little way fron the margin, so that when the platinum is removed, the plug will fit tightly on the margin as it bevels out, and will set in the thickness of the platinum removed, thus taking up the space occupied by it and making a perfect fit at the margin.

Second, in only partially filling the matrix with body, the first time it is baked, then replacing in the cavity and burnishing down the edge again, this corrects any springing of the matrix. For labial cavities, where there is no force to be exerted which will tend to loosen the filling, they may be used with Hill's Stopping, using a warm instrument handle to press them into place. This is, perhaps, more reliable as to lasting qualities than any cement which we have at the present day.

The Jacket crown, which is a platinum cap with a porcelain facing, is in certain cases very valuable. Its use is indicated for undeveloped teeth, usually called rice or peg teeth. These may be built out, and the normal appearance fully obtained. It is also of use for decayed teeth where the pulp has receded considerably and is in a healthy condition. It is of no use for decayed teeth of normal size, if the nerve has not receded, and they set in their proper position in the arch; because they must be ground so near to the pulp in order to get the facing on without its being too prominent, that the death of that organ is almost sure to result. There is no good reason why they should ever be used in any case where the pulp is not alive.

To construct this crown: Make a deep band or ferrule of platinum to fit the tooth which has previously been ground, slightly tapering on its sides and lingual surface, and flat and receding considerably on the labial surface. The inner portion of the band, which stands up from the tooth, is clipped off, and a flat piece soldered on to make the sloping lingual surface (supposing the crown to be an incisor or cuspid), and the anterior portion of the band ground very thin, except around the gum margin, this thin anterior portion is malleted down against the tooth, using a large foot plugger, and folding down the upper corners when necessary. A tooth is selected, either a flat back, or a plain tooth for rubber-work. It is ground away flat at the back, tapering down to as thin an edge as possible at the base. After grinding until it will set in the proper position, the cap is removed and the facing stuck on with a little porcelain body. The piece is then set on a tray, in which is a little ground silex to keep it from shifting around while in the furnace. It should be very carefully heated up in order that the facing may not be thrown off When cool, more porcelain is added around the edges to securely attach the facing, and after fusing, the crown is ready to be cemented in place. All these operations in porcelain are made infinitely more practical by the use of the low fusing porcelain body, which enables us to back up a tooth without etching its face, to fuse on to a bridge which is soldered to a gold cap, and to match the colors almost perfectly.

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Dr. J. Austin Dunn of Chicago has reduced the price of his Syringe with one Iridio-Platinum needle to $1.50. The Iridio-Platinum needle is something the dentists have always wanted but could not procure, and is a step in advance. The Iridium makes the needle stiff, so that it will wear smooth and is more lasting and durable. Another advantage is, that it can be held in the flame of the spirit lamp and cleaned by burning out the debris without danger of softening it. The price for extra needles has been fixed at fifty cents, so that they are within the reach of all.

# PROCEEDINGS.

## Southern Dental Association.—1894.

Twenty-fifth Annual Meeting, Old Point Comfort, Va., August 2-6, 1894.

Reported for the DENTAL REGISTER by Mrs. J. M. Walker.

[*Continued from October Number, page* 488.]

### HYGIENE.

The report of DR. W. E. WALKER, Pass Christian and Bay St. Louis, Miss., chairman of this section, was read by the secretary. The report reviewed briefly the literature of the journals on this subject during the past two years. He said—accepting as the definition of Hygiene—"that branch of medicine of which the object is the preservation of health," and including in dental hygiene all that pertains to the preservation of the teeth, the health of the mouth and its tissues, the health of the dentist and the hygiene of his surroundings, this subject covers a broad field, with many subdivisions. The papers which have appeared in the dental journals during the past two years may be classified as dental hygiene *per se*; the education of patients and the public in dental hygiene; the hygienic care of children's teeth, accepting another definition of hygiene, viz: "The philosophy of prevention in contradistinction to resistance and cure;" the special hygiene of the dentist and his surroundings; tobacco, from a hygienic point of view *pro* and *con*; hygienic precautions in the sterilization of instruments, the hands, etc.; hypnosis in its hygienic aspects; hygiene in the prevention or the arrest of decay, and last but not least, hygienic precautions in handling bank notes, quoting from the address of Dr. Ghion read before the Pan American Medical Congress in 1893, the alarming statement that "19,000 microbes of diphtheria, scarlet fever and tuberculosis have been found in a single bank note."

Dr. R. R. Freeman read a paper from Dr. T. C. West, Natchez, on "Oral Hygiene, especially in its connection with digestion." The mouths of many patients are rendered anything but pleasant to work upon owing to imperfect digestion. If the mouth were kept clean and the teeth kept in proper condition digestion would be better. The first stage of digestion is the conversion of food into a pulp-like mass which is accomplished by mastication and insalivation, in which the teeth, tongue and the salivary glands each have an important part to perform. Perfect mastication is not possible with imperfect organs for its performance, any more than a surgeon can perform perfect operations with broken instruments; the food, in the process of mastication and insalivation, if mixed with the debris from an unclean mouth and diseased teeth, is not in normal condition for reception by the stomach. Uncleanliness is a prime factor in nearly all diseases of the oral cavity. Patients must be taught the proper hygienic means of preventing this condition of things, though we too often fail in setting the proper example. Our first duty to our patients is to teach them how to care for the mouth and teeth. If an artificial denture is worn, they should be taught how to care for this. Whatever our work, whether fillings or crowns, plates or bridges, allow no spaces for the retention of particles of food to decompose in the mouth. Our work too often fails because we do not teach our patients how to care for it. Such teaching will be met with an appreciation that will amply repay the time and trouble bestowed upon it.

Dr. R. R. Freeman, Nashville, Tenn., read a paper entitled: "Hygiene."

As defined by Dr. Freeman, we understand by hygiene "the laws of health applied, whereby a man may come to his full vigor of life and accomplish that measure of usefulness and enjoy that happiness which human existence may afford." A knowledge of this science secures the means of battling against conditions likely to produce discomfort, pain, sickness or death. To appreciate the present relations of life and secure its greatest benefits, man must recognize his dual relations and act on the hypothesis of a spiritual or soul existence as well as a physical life; otherwise, the question "is life worth living?" might well be asked. Self-preservation is the first law of nature, but revelation has taught us to help the weak, succor the needy, and bind up the wounds of the afflicted. The violation of law entails calamitous results, whether against person, church or State. Health, happiness and prosperity are attainable only through the application of nature's laws. The Great Physician taught not only the value of the soul, but that its temple—these bodies of ours—must in no wise be neglected. The salvation of both soul and body is attained only through the good we do to our fellowmen. We, of the dental profession play no small part in helping to make it easy for our fellowmen to realize the blessings of life. Man may yet attain a great mastery through the science of hygiene. The light of truth and reason is fast dispelling the darkness; and honest, conscientious thinkers need no longer dread the opprobrious epithets of *crank* and *dreamer* because they maintain there is power and efficiency in the application of some of the agencies which have been discovered through the study of psychology, hypnology, etc., which if rightfully applied might soon hasten the reign of our lovely queen Hygeia. Why should the care of our bodies and the maintenance of health be deemed of less value than the æsthetic adornment of the dwellings we inhabit? The times are ripe for the advent of a new specialist—the Counselor of Hygiene.

Dr. Geo. J. Friedrichs, New Orleans, read a paper entitled: "Dental Caries and some Popular Fallacies." Among the causes most popularly assigned as factors in producing caries Dr. Friedrichs pronounced adversely upon such "causes of decay" as sweets, hot drinks, climate, soft foods, lack of cleanliness, insufficient use of the teeth, etc., his conclusion being: Given a perfectly organized denture, an unimpaired nervous system in a sound body, without inherited taint, and the teeth would never decay so long as this condition was maintained, irrespective of climate, food, or external agents; even cleanliness, now considered so essential, would be unnecessary, and be practiced only for comfort.

Dr. Cowardin thinks that the unhygienic diet of children, especially in the injudicious use of "sweets" to the exclusion of proper food is largely the cause of the poor teeth of so many children.

Dr. R. R. Freeman, on the other hand, believes that the appetite for "sweets" is a natural appetite in children, and that a proper indulgence in this respect makes them happy, and consequently, healthy. He quoted himself as still a child in that respect, still indulging freely in sweets, yet having a denture above the average for a man of his age. He said: Nothing touches me more than to see children deprived of their legitimate sweets! No matter how miserable or how pouting a child may be, they can't look cross while eating sugar candy. Never deprive children of what they enjoy. It is not the sweets that hurt them but the lack of other food in addition to the sweets. Candy made from pure sugar—not the cheap, chemically-adulterated stuff—makes children good natured and happy, and when they are happy they run and jump and exercise and are healthy. It is not the sweets, but it is high living, improper dressing, and enforced propriety of demeanor that is ruinous to the proper development of children and gives them the anæmic look and puny constitution.

Dr. J. Y. Crawford considers climate so conspicuous a factor in the production of dental caries that it may be classed among the zymotic diseases. Want of functional activity is also a pronounced factor. The influence of heredity he places at the tail end of the list of factors in the production of caries and irregularities. The present system of education, with the early confinement of young children to the school-room he considers conspicuously responsible for the early destruction of teeth. As only the dentist is competent to decide when the infant is fitted to leave the breast and masticate solid food, so also should he pronounce when it is prepared to masticate the food that will prepare both body and brain for the work of education. The ordinary American child, between the ages of four and nine, is not able to masticate the food that will enable it to bear the strain of the present school system. Too much money is spent at the wrong end of the line in this matter.

Before the subject of hygiene was passed Dr. A. C. Hewitt, Chicago, demonstrated from the platform his method of using chloroform as an obtundent, the patient inhaling a small amount of the vapor of chloroform from the mouth of a small vial, the effect being to deaden pain before reaching the point of anæsthesia. Dr. Hewitt claims to have used chloroform in this way, for the extraction of teeth, etc., for thirty years, and considers it absolutely safe. During that time he has never had an accident or even an alarming symptom. Being asked how he knew when he had reached the right point for the obtundent effect, Dr. Hewitt replied that he watched the countenance and noted a slight contraction of the nostrils as if there were a muscular effort to close them against the vapor; also a lazy drop of the eyelids, and an easy settling down in the chair. Inhaled in the manner described, he considered that the patient got about one part of chloroform vapor to one thousand of atmospheric air.

The Chair; There have been so many cases where the first inhalation of chloroform has proved fatal that it should not be allowed to go out as the voice of this Association that chloroform is ever absolutely safe. Although Dr. Hewitt has never had an accident, he may have been treading on the brink of the most imminent danger.

Dr. Sill, New York, thinks the methed of Dr. Hewitt possibly much safer than the ordinary mode of administering chloroform as so large a proportion of atmospheric air is inhaled. Instances were cited by several members of fatal, or nearly fatal, results from very slight inhalation of chloroform.

Dr. John S. Marshall was very emphatic in the declaration that *chloroform is dangerous*. He never administers it for the extraction of teeth unless the patient is at home, in bed, considering the recumbent position essential to safety.

Dr. Hewitt, on the contrary, believes the recumbent position a great source of danger, as the heavy vapor of chloroform settles down upon the face and clogs the lungs, while in the sitting posture, as in the dental chair, the falling vapor passes the nostrils and mouth, only the small amount being received that is voluntarily and forcibly inhaled. The question was discussed at great length by Drs. Sill, Noble, T. B. Welch, McKellops, Freeman, Friedrichs, Peirce, John S. Marshall.

Dr. John A. Daly read a paper on "Hygiene in Prosthetic

Dentistry," as reported under that section and Hygiene was passed.

The following new members were elected:

Dr. J. L. Wolf, Washington, D. C.; Dr. J. M. Quattlebaum, Columbus, N. Carolina; Dr B. B. Smith, Gainesville, Fla.; Dr. T. B. Welch, Vineland, N. J.; Dr. M. F. Finley; Washington, D. C.; Dr. Geo. Evans, New York;

### CLINICS.

The clinics constituted an important and interesting feature of the Southern Dental Association meeting.

**Dr. H. E. Beach** performed several surgical operations, principally extractions, one being of the first left inferior molar, being a case of necrosis of the alveolus with persistent abscess. In another case a badly-decayed left superior wisdom tooth was removed to allow the second molar, which was crowded out of position, to gravitate into place. In a third patient he removed a right superior bicuspid which was broken off under the gum, using as a local anæsthetic the following formula:

| | | |
|---|---|---|
| ℞ | Cocain - - - - | grs. viij |
| | Antipyrin - - - - | grs. xij |
| | Aqua dis - - - - | ʒ iij |

Mx

Sigma. Inject 2 to 5 minims in gum for removal of tooth.

**Dr. V. H. Jackson** exhibited and illustrated his "crib" appliances for regulating teeth.

**Dr. S. B. Cook** exhibited an appliance for regulating, made of bands and bars put together with vulcanite in which is placed a jackscrew. Dr. Cook also exhibited models at different stages of several cases which had been regulated with modifications of this appliance.

**Dr. Hollingsworth** gave a clinic with his original method of bridge-work.

**Dr. W. G. Browne** demonstrated the value of his method of using varnish for holding in position in the cavity the first large pellet of gold, into which he works strips of gold, relying on the varnish for *the start* merely of his filling, but not for securing the filling in the cavity. In this clinic Dr. Browne also demonstrated the special advantages of his new mechanical mallet.

**Dr. R. R. Freeman** filled the root-canals of a tooth with wax. He also made a tin and gold filling, using tin at the cervical wall, lining the buccal wall with gold to prevent discoloration and finishing the filling with thoroughly-annealed, extra-cohesive gold cylinders, making complete restoration of contour.

**Dr. Geo. Evans** demonstrated a new method of crowning front teeth; also a method of constructing hollow gold dummies for bridge-work.

**Dr. John S. Thompson** exhibited metallic models of block tin cast directly from plaster impressions, in which he makes celluloid plates.

**Dr. John A. Daly** described the method of making, and exhibited the method of using the Daly all-gold lining for rubber plates.

**Dr. Wm. Crenshaw** exhibited and used his new abscess drill, with a gauge, by means of which a blind abscess may be opened into through the gum tissue and alveolus, exactly at the point of the root of the affected tooth.

**Dr. C. Sill** exhibited a "traction engine" designed to draw into shape a sub-cervical band, when a superstructure of any kind is required on over-jutting crowns, without any mutilation of the tooth, avoiding the labor and pain of shaping a tooth as in ordinary methods.

**Dr. W. V. B. Ames** demonstrated the manipulation of a new germicidal cement, the oxy-phosphate of copper.

A number of promised clinics in crown and bridge-work, and in the working of metals, had to be abandoned, because of insufficient gas pressure.

A number of clinics on the printed program were not given, the operators not being present.

Among the clinics announced to the Association by the chairman of the Clinic Committee, Dr. J. Y. Crawford, was one on "Immediate Implantation," by **Dr. W. Irving Thayer**, Williamsburg, Mass. A voluntary essay by Dr. Thayer entitled "Root Filling" was also on the program.

The announcement of Dr. Thayer's clinic gave rise to a lengthy discussion of patented nostrums.

DR. H. J. MCKELLOPS said: Dr. Thayer is, I understand, the proprietor of a secret preparation. The use of this in a clinic for our Association should not be allowed unless he proposes to demonstrate exactly what he is using.

DR. CRAWFORD stated that the privilege of the floor and the clinic had been extended to Dr. Thayer, as it was understood that his paper covers what he uses. He was satisfied that no unclean thing would be proffered this Association.

DR. W. H. MORGAN: The code of ethics prohibits all secret remedies. If there is no secret about his anæsthetic, it is all well and good.

DR. THAYER said that he understood that he had given satisfaction in the matter to the chairman of both committees—clinics and voluntary essays; otherwise his clinic and paper would not have appeared in the program.

DR. MORGAN: Is the information Dr. Thayer has given free to all, or does it remain a secret with the chairman of the committees?

DR. THAYER: I will give you all the constituents of my anæsthetic, and you can make it for yourselves, but I will not tell you how I make it.

DR. F. PEABODY: This cannot be accepted by this Association unless the proportions of the constituents, the manner of compounding, and the method of using is given fully. It is not admissible before a professional body. He must not leave us in partial ignorance of what he apparently gives us, but he must make us able to do all that he does himself.

DR. H. B. NOBLE: There is nothing in Dr. Thayer's paper that is objectionable or it would not have been accepted by the committee on voluntary essays. I understood that in connection with his paper he was to give us exactly what he does and why he does it. I had no idea he intended to keep secret the way in which he prepares his preparation. If he proposes to use a secret compound and not tell us all there is about it, I withdraw my endorsement.

Dr. Thayer: My paper has no reference to anything I manufacture. It has no reference to any anæsthetic I make.

Dr. Cowardin: Dr. Thayer has not stated that he will give us the complete formula of the anæsthetic he proposes to use in his clinic, with the method of preparation and application. His paper seems to be acceptable, but unless he proposes to give a complete exposition of his remedy I would suggest that he abandon it in his clinic and use something that is acceptable to the Association.

Dr. Peabody: Unless he gives it to us so that we can all do what he does, understandingly, I do not see how the profession will be benefited.

Dr. R. R. Freeman: I understand that Dr. Thayer proposes to give us his secret, and yet having given it to you—seeing, you see not! hearing, you hear not!

Dr. Thayer: I will relieve the Association from the burden of my clinic.

Dr. H. E. Beach: Having seen Dr. Thayer's paper, I can say with a clear conscience that it does not contain a single reference to anything savoring of quackery or nostrums. He simply says, "use cocaine or other anæsthetic." When Dr. Thayer proposes to give the formula of his preparation he does all that we can ask. If a competent druggist cannot compound it from his formula then he has not given the correct formula.

Dr. Crawford: If Dr. Thayer can give us something that will enable us to perform our operations painlessly, we want it. If he gives us his formula properly written out and so constructed that we can prescribe it, that is as far as we can go. If he is entitled to read a paper, he is entitled to clinic. If he is not entitled to clinic he cannot read a paper. He cannot be ethical in one thing and unethical in another. If you are right I am with you. If you are wrong I am against you. This is no question of legality; no question of morality. It is a question of professional ethics. If he refuses to give us what he has got he is not entitled to the confidence of his professional brothers; he is not entitled to recognition. The question is—are you in full fellowship with your profession? Have you a secret that your profession needs? Open your heart; open your purse; help us to help humanity. Not for all the money in the world would I disregard one single obligation towards my brothers. I gladly tell all the little I know. This thing of patents and secret remedies is worse than a millstone around the neck. Far from keeping anything secret, I can't get you to believe the little I do know; I know that a tooth grows, but you won't believe that! If you have got a good remedy, for God's sake give it to us; there is not money enough in the world to repay you for keeping it back. I doubt if you get to heaven if you keep it back! Give it to us for those delicate women for whom we have to cut into sensitive dentine. Give us the means of lessening the pain we inflict. Give us the formula, and give us the method by which it is prepared.

THE CHAIR: The question is now in your hands. Shall Dr. Thayer give the proposed clinic?

DR. THAYER: To relieve the Association of all embarrassment, both clinic and paper are withdrawn.

This discussion held the Association 'till 11 P. M!

At the last session a resolution was adopted requiring the President to appoint a Clinical Staff, an organized clinical corps, a chairman and secretary and three helpers, with a view of making the clinics more satisfactory than by past methods.

By resolution adopted by the Southern Dental Association, all charter members are exempt from further payment of dues, beginning with the twenty-fifth annual meeting 1894.

A resolution was adopted reinstating members in arrears for dues, on payment of two years' dues, $6.00. A number of old members were reinstated on these terms.

Dr. H. E. Beach, chairman of the Committee on Revision of the Constitution and By-Laws, reported that he had not been able to obtain a meeting of the committee, consequently there was no report to be presented.

On motion, the committee was continued another year. Drs. H. E. Beach, E. S. Chisholm and B. H. Catching, committee

The Treasurer, Dr. H. E. Beach, presented the following report:

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|---|---|
| Balance on hand at last report | $290.27 |
| Cash paid out as per vouchers | 144.23 |
| Balance on hand | $146.04 |

Drs. W. R. Clifton and Jos. R. Woodly, the auditing committee, reported having examined the books and vouchers of the Treasurer and found everything correct.

The above statement does not include the receipts and expenditures of the present meeting, 1894.

### CHAPIN A. HARRIS MEMORIAL

Dr. T. H. Parramore spoke in feeling terms of the absence of the venerable Dr. W. H. H. Thackston, who by serious illness was prevented from laying before the Association plans for the erection of a monument of suitable character to the memory of Dr. Chapin A. Harris, "the father of modern dentistry."

He asked the Southern Dental Association to take the matter in hand and to take steps to have the matter brought before the different State Associations.

After some discussion, the Corresponding Secretary, Dr. E. P. Beadles was instructed to correspond with the officers of the various State Associations with a view to raising a fund for this purpose. Dr. H. E. Beach was elected treasurer of the Chapin A. Harris Memorial fund.

Drs. B. Holly Smith, J. Y. Crawford and J. S. Thompson, were appointed a committee to lay the matter before the American Dental Association.

As a nucleus, Dr. B. H. Smith donated to the fund the sum of $240.00 raised in Baltimore four years ago, by the Baltimore Chapin A. Harris Association.

A telegram of sympathy was sent to Dr. Thackston to which the following reply was received:

"Farmville, Va., August 6th, 1894.

"Loved Friends of the Southern Association:

"A thousand thanks for your kind remembrance and the sympathy expressed, which from my heart of hearts is reciprocated.

"W. H. H. Thackston."

## THE DENTAL PROTECTIVE ASSOCIATION.

Dr. J. N. Crouse, the manager of the Association made a statement giving the present status of litigation and also the financial standing of the Association. At his request, a committee was appointed to co-operate with a similar committee for the American Dental Association to examine the books, papers, vouchers, and mortgage notes of the Dental Protective Association.

The Southern Association appointed Drs. R. R. Freeman and V. E. Turner. The American Association appointed Drs. H. A. Smith, C. E. Esterly and Louis Jack.

This joint committee reported at a session of the American Association that they had examined the books and documents submitted by Dr. Crouse, and found that the funds received were fully accounted for, and the affairs of the Association economically administered, the money on hand being invested in good mortgage securities.

Dr. Crouse stated that the case with the International Tooth Crown Co., would probably be argued in October, in Brooklyn, and that it might be necessary to make an assessment upon the members of the Association to pay the lawyer's fees, as the mortgage securities could not be realized on at present without heavy loss.

## ELECTIONS.

ATLANTA, GEORGIA, was unanimously selected as the next place of meeting, the time being left for future announcement by the executive committee.

The election of officers resulted as follows:

Dr. H. E. Beach, Clarksville, Tenn., President.

Dr. J. S. Thompson, Atlanta, Ga., 1st Vice President.

Dr. L. P. Dotterer, Charleston, S C., 2d Vice President.

Dr. Seals, Fort Smith, Ark., 3d Vice President.

Dr. S. W. Foster, Decatur, Ala., Recording Secretary.

Dr. E. P. Beadles, Danville, Va., Corresponding Secretary.

Dr. H. A. Lowrance, Athens, Ga., Treasurer.

Dr. S. B. Cook, Chattanooga, Tenn., Dr. V. E. Turner, Raleigh, N. C., to fill vacancies on the executive committee.

The official publication of the proceedings was awarded to the Wilmington Dental Manufacturing Co., Philadelphia, the Company agreeing to publish an *edited edition* in sections in the regular issues of the *Items of Interest*, and to issue at a later date a full report in book-form for the members of the Association.

After passing the customary resolutions of thanks, etc., and the installation of the newly-elected officers, the Association adjourned to meet in Atlanta, Ga., in 1895, at a date to be announced by the Executive Committee.

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## The American Dental Association.

Thirty-fourth Annual Session, at Old Point Comfort, Va., August 7th, 1894.

Reported for the Dental Register by Mrs. J. M. Walker.

[*Continued from October Number, page* 506.]

### NOMENCLATURE.

Dr. S. H. Guilford, Secretary of Section II, read a report on "Nomenclature," of which an abstract follows:

He said: This subject had never received the attention which its importance demands. While we claim that our profession combines both science and art, yet we lack the most essential requisite of a science, viz: Exactness of expression. The whole literature of dentistry teems with examples of words used interchangeably, which vary greatly in shades of meaning, while others not infrequently fail to convey the meaning intended.

We do not find this so in any other science. In the so-called exact sciences—mathematics, chemistry, astronomy, as well as engineering, navigation—etc., each part, factor, manifestation or act has its single and appropriate designation. Were this not so, confusion would result, sometimes disastrously. In our haste and anxiety to further the material interests of our profession, we have, in a large measure, overlooked the character of the foundations on which we have been building. We can never lay just claim to being scientific until we have a vocabulary suited to our needs, and which will enable us to express our ideas correctly and without danger of misunderstanding or confusion. Reports, more or less satisfactory, on this subject have been presented to our societies from time to time; individuals, members of the profession, have also defined a nomenclature of their own and offered it for adoption. If the college faculties would all adopt a uniform system and teach it in the schools, good results would follow. But each system offered differs from all others, with individual peculiarities, which, instead of simplifying and systematizing our terminology, only add to the confusion.

In view of these facts, and the unquestionable importance of the subject, the section recommends that steps be taken by the Association to have prepared an intelligible, correct and systematic nomenclature, which by its inherent merits shall commend itself to the profession in general, and be universally adopted. The section was of the opinion that this end can be attained by appointing special committees selected from the men especially interested in each department, whose duty it shall be to carefully and studiously prepare a terminology, accurate and yet simple enough to be readily comprehended. The work would be arduous and long, but the results would be of incalculable value. The section also recommended that the system of dental notation given to the profession by Dr. Corydon Palmer some years ago, consisting in the use of Arabic numerals to indicate the permanent teeth and Roman numbers for the deciduous teeth, combined with horizontal and perpendicular lines to specify the arch and the side of the median line, be adopted by the Association.

On motion of Dr. B. HOLLY SMITH, a permanent committee on terminology, as recommended by Section II., was appointed, as follows:

Drs. S. H. Guilford, L. Ottofy, M. L. Rhein, Thos. Weeks, C. L. Goddard, L. D. Shepard, Grant Molyneaux, D. R. Stubblefield and A. H. Thompson. This committee is expected to report progress annually, and be continued from year to year. The adoption of the system of notation of Dr. Corydon Palmer was referred to this committee.

Dr. Guilford also read a paper by Dr. M. L. Rhein, entitled: "The Etiological Classification of Pyorrhœa Alveolaris."

He said: Various forms of pericemental inflammation with purulent discharge at the gingival border have afforded points of dispute for years. The etiology, pathology and treatment of this disorder will furnish a field for *battle royal* at our meetings until science shall have vanquished this destroyer of dental organs. The names given to this disease are as varied as its manifestations.

The name "Riggs' Disease" was bestowed upon it in honor of the man who first called the attention of the profession to the feasibility of combating its ravages.

The name *Pyorrhœa Alveolaris* has a strong foothold, and it would be as easy to eliminate the word *dyspepsia* from the menclature of the medical profession as *Pyorrhœa Alveolaris* from that of dentistry. But although this name only expresses the single clinical feature of a flow of pus from the alveolus at the gingival border, it has been used indiscriminately to express the most severe and complicated form of the disease in question, as well as the simple and uncomplicated To obviate this difficulty would be to remove one source of contention, and leave time for the investigation of more important matters.

Dr. Rhein submitted a plan of etiological classification of various phases of the disease, retaining the name Pyorrhœa Alveolaris as generally descriptive of any condition where pus flows from the alveolar borders, but classifying the various forms of the disease. He would first make the two grand divisions of:

I. Pyorrhœa Simplex, and II. Pyorrhœa Complex.

I. *Pyorrhœa Simplex* would include all cases of purely local origin and cured by local means. Lack of hygienic conditions, unsanitary conditions are at times the sole cause of a purulent discharge. This is purely local and yields to local treatment. In other cases, malnutrition—a poverty of the life-endowing corpuscles—plays an important role.

II. *Pyorrhœa Complex*, by different writers, called "true pyorrhœa," "phagedenic pericementitis," "hæmatogenic calcic pericementitis," presenting numerous peculiar or obscure clinical features.

To the numerous subdivisions of this grand division, with its complex varieties, Dr. Rhein proposes to add a modifying word, which shall indicate the etiology of each case after careful diagnosis.

Class A would include cases complicated with or due to gout, diabetes, chronic rheumatism, Bright's disease, scurvy, chlorosis, anæmia, leucæmia, pregnancy.

B. Cases having their inception during attacks of acute or infectious diseases, as typhoid fever, tuberculosis, malaria, acute rheumatism, pleurisy, syphilis, etc.

C. Nervous diseases, as spinal diseases, neurasthenia, hysteria.

D. From the toxic effects of drugs, as mercury, lead, iodine.

E. Pyorrhœa sequentia, arising after the prime cause of disease has been removed.

For each of these classes a compound term, such as "gouty pyorrhœa," "mercurial pyorrhœa," "tuberculous pyorrhœa," etc., would be clearly understood, indicating the pathology and treatment of the case in a concise manner without the interjection of any irrelevant matter.

The report of Section VI. included a review of the recent journalistic literature of Pyorrhœa Alveolaris, notably, the writings of Dr. C. N. Peirce, G. V. Black and J. E. Cravens.

**Prof. Peirce** being requested to open the discussion, said that Dr. Rhein's paper had opened up the subject in a practical manner, and was worthy of notice as an intelligent and interesting effort to differentiate the multiform phases of the group of disorders indiscriminately known as pyorrhœa alveolaris, some of which are amenable to local treatment, while others are not even modified by it. The first step in the treatment is to differentiate the conditions. What has been called "true pyorrhœa," which causes the loss of the teeth, is of constitutional origin, deposits beginning at or near the apical end of the root. The "pockets" are secondary effects. Dr. Black has failed to recognize these conditions, or has not met with them in his experience. He states that ordinary gouty conditions are not attended by the suppurative conditions. It is true this is not usually the case, but numerous instances are on record where suppuration has followed gouty deposits in the joints. The tissues around the root of the tooth are very susceptible to irritation, and have inflammatory conditions and suppuration follow these "serumal" deposits, beginning at or near the apex of the root.

Dr. Abbott: I am a good deal like Dr. Black, in that I have not yet seen the conditions described by Dr. Peirce, with the deposits beginning at the end of the root, and followed by suppuration. I cannot conceive how this can exist without the formation of an abscess and terrific pain and distress before the outpour, the tissues are so dense and unyielding. I believe this disease is due to both local causes and to constitutional disturbances localized in the mouth. I think there is always some local disturbance at the margins of the gum, very slight perhaps, the impaction of particles of food affording a menstruum for the infiltration of lime salts. If the physiological functions of the system were all perfect there would be no such disease, but science says there is no such thing as absolutely perfect physiological action. There is no such thing as an absolutely perfect eye or ear. None of our organs are absolutely perfect in function. Hence the tendency to abnormal deposits of lime salts in the mouth and elsewhere in an effort to get them out of the body in that way. In all this talk about nomenclature and terminology, there is too much "fuss and feathers." What we need is an understanding of principles rather than an accumulation and multiplication of names for the same conditions. Words should be used to express ideas. The simple term pyorrhœa alveolaris expresses clearly the conditions we find.

Dr. Crawford: I will state it differently. The condition known as pyorrhœa alveolaris will never occur in any case without the precedent condition of an issue. Whether of local or constitutional origin, after the removal of *all the teeth* you will never see pyorrhœa alveolaris. Deposits on the roots are the sequellæ of a sinus. The characteristic pockets and all the variable conditions will invariably be found to have had the precedent condition of an issue, though very mild perhaps. Practically, we make more mistakes in physical diagnosis than in anything else. I would not enlarge our vocabulary at the expense of the truth, but I am pleased with Dr. Rhein's division of simple and complicated pyorrhœa, though I doubt the use of the terms "simplex," "complex," "sequellæ," etc., make it any more easily understood than plain language, which we are all competent to understand.

Dr. Abbott: I wish to ask Dr. Crawford what he understands by a "precedent issue?"

Dr. Crawford: A wound—an opening through which infection enters—whether it is a pin point puncture or an erosion as big as your hand. An "issue" is an opening. Mercury manifests itself in ptyalism only where local precedent conditions were favorable. With corresponding precedent pathological conditions elsewhere, it manifests itself in other portions of the body.

Dr. Rhein: I have been studying this disease for twelve years, and my observations lead me to believe firmly in the correctness of the views expressed in my paper. It is true that others, with equally good powers of observation, have reached opposite views; but we are not all equally careful in our observations, we are not all under the same conditions, we do not all meet with the same features. The conditions exist in very variable degrees. We cannot doubt that the conditions as seen by and described by Dr. Peirce do exist, and that he has found these apical deposits without any perceptible break at the gingival border. Because another man has not seen it is no proof that it does not exist. To my mind nothing can account for the varying phases and clinical features presented, except the varying causes found in varying constitutional conditions prevading the system at large. The question as to why these disturbances manifest themselves about the teeth was most nearly answered by the late Dr. Atkinson, when he said there was no tissue in the body so nearly resembling original protoplasm as the mucous membrane about the teeth. The tissues of the socket of a tooth are different from all joint sockets, being the softest and most vulnerable. That is why it is so extremely susceptible to lack of nourishment with consequent retrogression to primeval order.

Dr. John S. Marshall referred to a paper which he had read some years ago before the Medical Association at Washington, on the gouty and rheumatic diathesis, in its relation to the peridental membrane, and spoke of uric acid deposits found at the apex of the root, when the most careful examination with the finest steel probe failed to show any break at the gum margin, or any opening until one was made with the bistoury. A sufficient number of cases of this kind have been found to establish the fact that it does occur. This deposit is a urate of soda. Because this uric acid reaction from serumal calculus, is not found in salivary calculus is no proof of its non-existence. It is found in more cases where there is no history of gout, and where the urine fails to afford the uric acid tests. This disease of the peridental membrane is sometimes the very first premonitory symptom of the rheumatic diathesis. The treatment as per gouty diathesis—cutting off all meat and wine—putting on lithia or distilled water (and I have found distilled water better than lithia in some cases.) As long as that line is followed there are no exacerbations of the disease, but drop it, and it comes back again. One good dinner, with game, champagne, etc., will undo the work of weeks in treating this disease. So long as the patient denies himself he is comparatively free from trouble. So I maintain that these uniform results are proof that the disease is a manifestation of the uric acid diathesis. There is also a condition of pyorrhea alveolaris, resulting from displacements of the uterus and pregnancy. A number of cases have been reported of beneficial results in the mouth from the replacement of the uterus. There are many cases the result of neurasthenic condition, and it will not do to assert dogmatically that it is always due to local conditions.

Dr. Crouse: That there are cases in which the deposits on the root, before there is any external break in the tissues, is beyond a doubt. The correctness of such a diagnosis has been proved by the extraction of the offending tooth.

On the Sunday before Dr. M. S. Dean's death, I dined with him. The day before, "a great big fellow" had compelled me to extract a tooth which presented no signs of anything as the source of trouble, but he had the toothache, and the tooth was sore, and out it must come. It was an upper molar, and on one of the roots I found a tiny spot, black as jet, near where the pulp passed in. I showed it to Dr. Dean and asked how that calculus could have gotten there. The tooth was not at all loose, and gave no evidence externally of being in any way affected. Two or three years later the man came back with the other sixth year molar affected in the same way. In some cases where I have suspected this to be the cause of trouble, it has got better. Either the deposit has been tolerated by nature, or it has perhaps been absorbed and carried off. It is the most distressing disease in dental pathology, and it prevents me from crowning many teeth. We can get rid of every other trouble, but this is incurable.

Dr. Noble said that two years of careful observation had led him to a change of opinion, and he now believes that although it is rare, yet cases do occur with patients of gouty diathesis, of little deposits of serumal calculus near the end of the root with no opening at the margin of the gum. But probably the majority of cases of pyorrhœa alveolaris result from pockets—an "issue," to use Dr. Crawford's term. Very careful observation, however, will lead to the conclusion that Professor Peirce's position is correct.

Dr. W. H. Morgan: It may be so, but I have never yet met with a case where I did not find an opening, either along the alveolus or through the root canal. I have examined very carefully, because these cases give so much trouble. I must repudiate the idea given forth by one speaker, that calculus is ever broken down and absorbed. If in the liver, or bladder, or soft tissues, it may wander around, but it is never absorbed. Nature has three modes of getting rid of foreign bodies, and one of them is by absorption, but we have no evidence that calculi in any part of the body have ever been absorbed.

Dr. Crouse: In one case four upper molars were successively attacked with the same symptoms. I removed the first one to relieve acute suffering, and found a small amount of black deposit on the root. I took out the others as they presented without waiting for protracted acute suffering, though the teeth were perfectly firm, and I found this same black deposit on each one of the four upper molars in the same mouth.

Dr. Frank Abbott: I think this was a case simply of hypnostosis, mistaken for deposits of the other character—an enlargement of the cementum causing periosteal inflammation.

Dr. C. N. Peirce: The evidence is very complete that there is this connection between pyorrhea alveolaris and the gouty diathesis. Every clinician who writes on gout states that as an accompaniment, "the teeth loosen and fall out." Medical practitioners often unwittingly effect a cure of this disease by their anti-gout treatment of malarial conditions. The patient, with his other symptoms, suffers from intense pain at the roots of the teeth, with inflammation of the surrounding tissues.

Abstention from meat and other anti-gout treatment cures this. One case only: a gentleman came to me last January to have his tooth out—was suffering so that he could not stand it any longer—had to walk the floor all night, etc. On examination I found the ravages of pyorrhea, pockets and so on. I asked him what he had been doing for it. He replied, that he was under a physician's care for kidney trouble. I said that if he placed himself in my care I would put him on the dietary and remedial treatment for gout, he assented and was literally cured by this constitutional treatment. I gave the necessary local treatment at the same time, but he had had that for five years elsewhere without benefit. The anti-gout constitutional treatment in connection with local treatment is successful in so many cases that it is only fair to assume the connection between gout and pyorrhœa alveolaris.

Dr. Rhein: The case described by Dr. Crouse represents a number of cases that have been under my observation. Dr. Abbott questions the correctness of Dr. Crouse's diagnosis, but men often assume that other men are not capable of diagnosing obscure cases. For many years the practice has been advocated of removing the pulps in such cases, but in regard to the ultimate result it cannot always be depended upon.

Dr. Taft: In view of the great importance attaching to this subject, I would suggest the appointment of a committee or commission for the special investigation of this subject, to make a report at the next meeting of this Association. If this is done and special work devoted to it, we will get at something more definite than is now known.

One factor has been overlooked in the present discussion, and that is the non-use of the teeth. In many cases defective nutrition is a factor. When one or more teeth are lost the opposing teeth elongate. How is that caused? The teeth do not grow. There is a thickening process going on in the socket, which fills up, and the tooth is gradually thrown out, a thickening of the pericementum, showing that a change is going on in this membrane that is about out of use from lack of normal functions. It is not at all analagous to alveolar abscess; the latter is rapid, with acute inflammation, with loss of structure of all the tissues, both hard and soft. In pyorrhœa alveolaris that is not true; this affection seems confined to the pericemental structure. An ordinary small instrument shows no loss of substance; there is no large cavity about the end of the root in the pericemental membrane involved. What has non-use to do with this? Evidently a change takes place in the pericemental structure when the teeth are out of use. Proper use is necessary for the proper function of this tissue. Take any joint and maintain it in a condition of quiescence—quite free from movement, and it will not be long before there is a changed condition—a filling in or precipitation of calcareous or other matters precipitated from the fluids of the body. In the main, pyorrhœa is a local affection, but systemic influences modify its progress. Some teeth will rest for years without elongating, but others elongate very rapidly, and it is always those that are not used; those that are the most used are the most healthy. There are other points that would make this discussion too long. I move that a committee be appointed to make special investigations along this line.

**Dr. John S. Marshall**: It is not always easy to decide if an affected tooth has a live or a dead pulp, but there is one positive method, and that is the Faradic current. Applied to a tooth, if the pulp is living you get an instant response. Give the patient one pole and hold the other yourself; place your finger on a known dead tooth and there is no response; place it on a live tooth and the patient jumps; then place it on the suspected tooth, and the Faradic current will tell you positively whether the pulp is alive or dead.

Dr. Bogue: I am heartily in favor of the committee proposed by Dr. Taft, and Dr. Marshall for one of that committee. There are three causes for roughening of the end of the root; the first is from deposits at the apex; second, from absorption, and third, from causes beginning at the gingival margin. A case of the second class lately came under my observation. After treating in vain for six months, I extracted the tooth and found considerable absorption, but no deposits and no discoloration. In three or four places there were points as sharp as needles.

Dr. W. H. Morgan: How would you differentiate whether it was a case of absorption or of malformation? Was the end of the root covered with periosteum?

Dr. Bogue: The patient had been in my hands for many years, and had lost many teeth from salivary calculus in spite of all my efforts. This left lateral was loose, and useless compared with the other teeth, and I saw what I believed to be clearly *absorption* as described.

Dr. Harlan: With reference to deposits on the roots of living teeth, where there is absolutely no opening at the gingival margin of the alveolus, there is no evidence that those deposits originated while the patient was suffering from gout or rheumatism; there is nothing to show that there had not been some antecedent injury sufficient to produce deposits on the root through the agency of micro-organisms. As far as I know, no analysis has been made of deposits on roots of teeth where the continuity of the gingival margins was not destroyed. How many cases of such deposits have been found? Has the difference been established between the deposits on the roots where there is, and where there is not a break in the continuity of the gingival margins? Deposits do occur, and have been found, but I seriously question if it has been demonstrated that the deposits result from the gouty or rheumatic diathesis. Without the formation of a nidus of some character, under the periosteum or on the cementum itself, accessible to bacteria, such deposits cannot take place. It is impossible to produce suppuration without the presence of micro-organisms. As far as I know, micro-organisms of gout and rheumatism have not been discovered in connection with the deposits of this disease.

Dr. Taft: The deposits in question do not depend upon the conditions described by the last speaker. These salts are held in solution in plasma, perhaps in serum, and are deposited in the root from some change taking place, causing precipitation. The solvent is no longer able to hold them in liquid form, and precipitation takes place. I hope we will get men who will work in dead earnest on this commission; push the work hard, and tell us more than has yet been elucidated.

Dr. Rhein: I feel convinced that the prime necessary condition of all the complex varieties of pyorrhœa is mal-nutrition—atrophy. Dr. Harlan says that the claims made have not been clearly demonstrated, but it would take too much time here to detail the causes which have furnished the evidence. It is not implied that gouty conditions are necessary to bring about every case of deposits. They are just as possible in neurasthenia, Bright's disease, diabetes, or from mal-nutrition. There are other forces as well as gout. Toning up the system always has beneficial results.

Subject passed.

At a later session, in accordance with the resolution offered by Dr. Taft, a committee of five, consisting of Drs. C. N. Peirce, John S. Marshall, E. C. Kirk, M. L. Rhein, and J. Taft was appointed as a commission, whose work it shall be to make special investigation in the endeavor to ascertain the etiology, pathology and treatment of pyorrhœa alveolaris, being authorized to draw on the Treasurer for a sum not to exceed $75.00, to cover the necessary expense of this work.

## SECTION VI. PHYSIOLOGY AND ETIOLOGY.

Dr. S. B. Palmer, Syracuse, N. Y., read a paper on the "Etiology of Dental Caries."

Dr. Palmer referred to papers read by him twenty years ago, upon the chemical and galvanic action between tooth substance and the materials used for their preservation. His teachings on this subject were in advance of the times and met with much opposition, but during the twenty years that have passed since those views were advanced, science has overcome prejudice and the principles then advanced are quite generally admitted. Dr. Palmer proceeded to give a summary of the conclusions reached, taking the filling materials as the elements of a battery, defining principles and citing cases. In regard to the potential relations of matter, electrolysis must be understood as the principle governing the composition and decomposition of matter. Following this to its terminus in the oral cavity, dental caries is an effect of the electro-potential relations of matter. Dr. Palmer then defined the terms used in electrical science, describing the phenomenon known as electrolysis with its application to dental science, a tooth being considered as an electrolyte. The electro-chemical theory is founded on natural laws. There is a continuity of law through the inorganic, the vegetable and the animal. Organized tissues are subject to decomposition and decomposition resulting from electro-chemical action.

When gold is malletted against the frail walls of a tooth the bruised surface of porous dentine becomes an electrolyte. The metal used being at a potential above that of the dentine, decay results as an effect of electrolysis. This is entirely apart from primary and independent of the caries arising from ferments, organisms and organic acids. Very important discoveries have been made in regard to chemical action in the mouth and the use of antiseptics to prevent fermentation and destroying organisms. But this does not offer a remedy for the arrest of decay from the action of oxides.

Dr. Palmer then described the peculiar complications found in the oral cavity, with its undercurrent of oxygen—a negative element—the tooth an electrolyte raised to the animal or vegetable plane ready to be acted upon and soon destroyed. If the bruised portion of an apple is cut out with a sharp blade and the surface dried the wound heals. It is the same with a tooth; cut out the disorganized portion, insert the filling of such material as shall exclude moisture and oxygen and there will be no secondary decay. If the dentine is below normal, supply the deficiency by an agent not affected by oxygen; as the ranchman burns a space around his stakes and satisfies the demands of oxygen so that fire stops at the line prescribed. If softened dentine and cavities in deciduous teeth are treated with nitrate of silver the oxide of silver raises the potential of the dentine above that of the secretions of the mouth and caries is arrested or prevented. Nineteen years ago Dr. Palmer wrote "on this principle nitrate of silver turns the teeth dark and checks caries." Oxygen under the laws which govern the positive and negative relations of the elements is the primary agent which produces dental caries, and to arrest decay we utilize the oxides—which are proof against oxygen—through the means of metal fillings which are of higher potential than the organic constituents of dentine. Tin fillings furnish an insoluble stannic oxide through the simple process of oxidation. No decay occurs as long as the black carbonate remains, but it is soft and does not resist the brush or pick. If gold and tin are joined in a filling, by electrolytic action, there is an interchange of atoms and an alloy of tin and gold is formed, raising, by induction, a portion of the tin to the same potential as gold, but if not more than two layers of tin are used, the dentine is furnished with a carbonate and gold can be successfully used where otherwise it would be a failure. Decay around gold fillings is in obedience to laws which manipulative ability cannot counteract. The current from the filling of higher potential decomposes moisture in the dentine, liberating oxygen, which is attended with an acid, dissolution of lime salts being the result.

In all alloyed amalgams there are unamalgamated particles in the mass which are negative, the amalgamated portion being positive, consequently local galvanic action is established, oxidation filling normal dentine with oxides and sulphide and no harm is done; *but* if the dentine is below normal, local action is too vigorous, the lime element of the dentine is dissolved, the cavity enlarged and the plug reduced. Line the cavity in such teeth with tin, pressing it in with a ball burnisher and you get the benefits of oxidation filling the tubuli with an insoluble compound, while no local action takes place to cause shrinkage of the plug. The stannic oxide is not objectionable in color and prevents shrinkage from galvanic action which occurs without the tin lining. Suggestions for root filling are based on the same principles. All fillings below the gingival margin are in an alkaline field. Here oxygen gives an alkaline reaction which is the reason why unfilled root-canals do not enlarge in the same proportion as cavities in tooth crowns. Here acid treatment is indicated and is beneficial in destroying micro-organisms. In filling root-canals the opening at the apex is a spring which cannot be dried up; capillary attraction keeps the fine canals filled until the leak is stopped. If an oily substance is used some oil remians which cannot be volatilized even with broaches heated with electricity. In time the oil is oxidized and the canal becomes filled with septic matter. But introduce the liquid of oxychloride, which checks bleeding, and fill with a thin mix; force in a gutta-percha point which forces all excess of fluid out through the apex and the opening is closed. The permanence of gutta-percha consists in the oxide which remains after the gum is oxidized; this preponderance of oxide prevents further oxidation. The liquid phosphate is not metallic, hence the benefits of the oxychloride over the oxyphosphate. Dr. Palmer described minutely the laboratory experiments which confirm the positions taken and the principles established. In conclusion he said: Dental caries is an effect of universal principle, based upon the potential relations of matter, oxygen being the principal element aided by electrolysis and capillary attraction under the direction of electrical energy.

[*To be continued.*]

## The National Association of Dental Examiners.

The thirteenth annual meeting of the National Association of Dental Examiners was held at Old Point Comfort, Va., begining Tuesday, August 7, 1894; Dr. J. Searle Hurlbut presiding. In the absence of the secretary, Dr. C. A. Meeker was appointed secretary *pro tem.*

The following State boards were represented:

*Alabama*—T. P. Whitby.
*Delaware*—D. M. Hitch, C. R. Jefferis.
*District of Columbia* H. B. Noble, Wms. Donnally.
*Georgia*—B. H. Catching.
*Illinois*—L. L. Davis.
*Iowa*—J. T. Abbott.
*Kansas*—L. C. Wasson.
*Kentucky*—C. G. Edwards.
*Massachusetts*—J. Searle Hurlbut.
*New Jersey*—F. C. Barlow, Chas. A. Meeker.
*North Carolina*—V. E. Turner.
*Pennsylvania*—W. E. Magill, Louis Jack, L. Ashley Faught.
*Tennessee*—J. Y. Crawford.
*Virginia*—J. Hall Moore, E. P. Beadles.

The secretary read a communication from the Board of Examiners of the State of Minnesota, insisting that their resignation, tendered in 1892, should be accepted. On motion of Dr. C. G. Edwards, the resignation was accepted.

An application for membership from the Board of Examiners of the State of Oregon was received, and the secretary instructed to answer the same.

On motion of Dr. F. C. Barlow, the secretary was instructed to have the constitution, by-laws, and standing resolutions to date printed in pamphlet form and sent to all members of the association.

On motion of Dr. Louis Jack, the secretary was instructed to have the proceedings of the association at its meetings of 1893-94 printed in one pamphlet.

The secretary read a memorial from the Examining Boards of New York, New Jersey, Delaware, Rhode Island, Connecticut, Pennsylvania and the District of Columbia, regarding the necessity of uniformity in standards of examinations in different States, which with the following resolution on the same subject, laid over last year, was referred to a committee consisting of Drs. Faught, Crawford and Catching:

*Resolved*, That it is the sense of the National Association of

Dental Examiners, that when a member of the dental profession presents a certificate of resignation from a State board of dental examiners, duly created by law, that the same should entitle the holder of such certificate to registration without an additional examination in any State of the Union having a law to regulate the practice of dentistry. *Provided*, such certificate was obtained on examination.

The committee subsequently reported, recommending the adoption of the memorial as expressing the sense of the association.

The report was adopted, a verbal amendment to the memorial offered by Dr. Donnally being accepted, making it read as follows:

*To the National Association of Dental Examiners:*

Gentlemen—Delegates from the examining boards of New York, New Jersey, Delaware, Rhode Island, District of Columbia, Pennsylvania, and Connecticut, in conference assembled, respectfully offer for your consideration the opinion that ours is an advancing profession, our watchword is progress, and we ask that your influence shall be actively directed to secure thorough preliminary examination in every dental college in every State.

We think the true interests of our profession demand such uniformity in standards of examinations as can be obtained by State boards, always striving after higher and better attainments, and with a view to ultimately bring about a safe, judicious, and fair reception of certificates from State boards of other States.

It is our opinion that it would be most desirable that a law whose provisions should be uniform, yet whose phraseology might be different, so as to suit differences of environment in the various States, should be enacted in all the States. It is not practicable to have any such law enacted in all the States at once; but if such a law were enacted in half a dozen leading States, other states would gradually fall into line and adopt similar ones.

We are in favor of bringing responsibility for defective education as directly as possible upon the offending school, with a view to making every diploma real and reliable evidence as regards the holder's ability and proficiency. Therefore we will use our influence as practitioners, as well as members of examining boards, to obtain the selection, by competent authority, in each State, of an independent body, disconnected from the institutions which educate, with sole authority to grant licenses and admit to practice.

G. CARLTON BROWN, *Secretary.*

The Committee on Colleges reported that there are now twenty-eight recognized and fifteen unrecognized colleges; that there have been no additions to the accepted schools.

The chairman, Dr. Jack, read the following report of the numbers of matriculates and graduates at the different schools:

| RECOGNIZED SCHOOLS.—1894. | FRESHMEN. | JUNIORS. | SENIORS. | GRADUATES. | POST-GRADUATES. |
|---|---|---|---|---|---|
| 1. Baltimore College of Dental Surgery, Md. | 47 | 45 | 40 | 37 | |
| 2. Boston Dental College, Mass. | 55 | 55 | 35 | 33 | |
| 3. Chicago College of Dental Surgery, Ill. | 127 | 116 | 69 | 58 | 28 |
| 4. College of Dentistry, Department of Medicine, University of Minnesota. | 23 | 12 | 6 | 6 | |
| 5. Dental Department Columbian University, D. C. | 12 | 19 | 8 | 8 | 1 |
| 6. Dental Department National University, D.C. | 6 | 9 | 8 | 8 | |
| 7. Northwestern University Dental School, Ill. | 33 | 36 | 25 | 24 | 6 |
| 8. Dental Department Southern Medical College, Ga.* | | | | | |
| 9. Dental Department University of Tenn. | 16 | 12 | 12 | 10 | |
| 10. Dental Department Harvard University, Mass. | 31 | 14 | 18 | 14 | |
| 11. Indiana Dental College, Ind. | 29 | 32 | 23 | 23 | |
| 12. Kansas City Dental College, Mo. | 54 | 36 | 18 | 16 | |
| 13. Louisville College of Dentistry, Ky. | 54 | 27 | 10 | 9 | |
| 14. Missouri Dental College. | 41 | 31 | 21 | 21 | |
| 15. New York College of Dentistry. | 111 | 92 | 81 | 62 | 1 |
| 16. Northwestern College of Dental Surgery, Ill. | 32 | 36 | 25 | 24 | |
| 17. Ohio College of Dental Surgery. | 57 | 57 | 34 | 34 | |
| 18. Pennsylvania College of Dental Surgery. | 100 | 80 | 63 | 62 | |
| 19. Philadelphia Dental College. | 93 | 107 | 78 | 77 | |
| 20. School of Dentistry of Meharry Medical Department of Central Tennessee College. | 4 | 3 | 3 | 3 | |
| 21. Dental Department University of California. | 68 | 45 | 18 | 18 | |
| 22. Dental Department University of Iowa. | 70 | 39 | 32 | 31 | 1 |
| 23. University of Maryland, Dental Department. | 58 | 54 | 36 | 34 | 2 |
| 24. University of Michigan, Dental Department. | 67 | 52 | 66 | 64 | 1 |
| 25. University of Pennsylvania, Dental Department. | 81 | 72 | 65 | 64 | 3 |
| 26. Vanderbilt University, Tennessee. | 55 | 44 | 25 | 25 | |
| 27. Western Dental College, Mo. | 42 | 36 | 27 | 26 | |
| 28. American College of Dental Surgery, Ill. | 128 | 71 | 51 | 44 | 77 |

*No report.

| UNRECOGNIZED SCHOOLS. | FRESHMEN. | JUNIORS. | SENIORS. | GRADUATES. | POST-GRADUATES. |
|---|---|---|---|---|---|
| University of Denver, Dental Department. | 9 | 4 | 3 | 3 | |
| University of Buffalo, Dental Department. | 38 | 32 | 6 | 6 | |
| Cincinnati College of Dental Surgery. | 5 | 3 | 5 | 5 | |
| Atlanta Dental College. | 61 | 31 | 26 | 26 | 8 |
| Howard University, Dental Department. | 6 | 6 | 5 | | |
| Dental Department Homœopathic Hospital College. | 12 | 7 | 4 | 4 | |
| Western Reserve University, Dental Dep't. | 9 | 15 | 4 | 4 | |
| Cincinnati College of Medicine and Surgery, Dental Department. | | | | | |
| Detroit College of Medicine, Department of Dentistry. | 16 | 21 | 1 | 1 | |
| University College of Medicine, Department of Dentistry, Richmond, Va.* | | | | | |
| The New York Dental School.* | | | | | |
| Birmingham Dental College, Alabama. | 17 | 7 | 3 | 3 | |
| Marion Sims College of Medicine, Dental Department, St. Louis (first session, Sept. 11th, 1894). | | | | | |
| Dental Department, Tenn. Medical College.* | | | | | |
| United States Dental College, Chicago.* | | | | | |

* No report.

On motion of Dr. Meeker, the following was adopted:

*Resolved*, That any State board not represented by delegates at three successive meetings of this body should forfeit its membership.

On motion of Dr. Louis Jack, the following was adopted:

*Resolved*, That this body require the board of Examiners in each State to become informed of the character of any school which may have been organized within its jurisdiction, and to have especial care in its scrutiny of any college which may have applied for admission to the National Association of Dental Faculties.

The following were elected officers for the ensuing year:

L. Ashley Faught, President; J. T. Abbott, Vice-President; Chas. A. Meeker, Secretary and Treasurer.

After which the association adjourned to meet at the time and place appointed for the next annual meeting of the American Dental Association, this body to convene at 10 A.M. on the day preceding the date set for the meeting of the American Dental Association.

# NOTICES.

## American Dental Society of Europe.

The nineteenth annual meeting was held at Geneva, August 6th to 8th. The following officers were elected for the ensuing year:

President, Dr. Chas. W. Jenkins, Zurich.

Vice-President, Dr. Wm. Mitchell, London.

Treasurer, Dr. Chas. J. Monk, Wiesbaden.

Secretary, Dr. Wm. S. Davenport, Paris.

Executive Committee, Dr. Jenkins, Dr. G. C. Daboll and Dr. A. C. Hugenschmidt, of Paris.

Membership Committee, Dr. Mitchell, Dr. L. C. Bryan, of Basel, Dr. Waldo Royce, of Tunbridge Wells.

The next meeting will be held at Boulogne, the first Monday in August, 1895.

WM. S. DAVENPORT, *Secretary.*

# EDITORIAL.

## Union.

There are in the United States two associations, each claiming in some respects national character. The one, the American Dental Association, was formed by delegates from existing local and State societies; this is the only channel for the continuation and support of its membership. It was organized in 1859. The other, the Southern Dental Association, consists of a membership that is brought in through a membership committee. Any reputable member of the profession, upon application to this membership committee, may be received regardless of membership in any other society.

The question has been frequently asked in past years as to whether the interest of the profession as a whole is best subserved by the continuance of these two bodies. In the early years of these associations circumstances did not seem to be as favorable for their union as now exist. The condition of these two bodies is so changed within the last few years, by holding combined sessions and by interchange of membership, that now no good reason exists for the separate organizations. Doubtless, the consensus and indeed the wish of a large number of the membership of both bodies is that a union should be effected. A movement has already been made looking to this result, and it is earnestly to be hoped that the matter will be taken up by those having it in charge and carried to a successful conclusion. There is no apparent reason why this division should longer exist; it certainly is a waste of power and resource. The profession is homogeneous throughout our country, and the representative body of the dental profession should have its membership from the profession in all parts of the country. If ever any jealousy or antagonism existed between these two bodies there is certainly now nothing of these extant. Many have membership in both bodies. Many dentists of the north have membership in the Southern Dental Association and are in almost constant attendance upon its annual gatherings; the same is true in regard to Southern dentists in respect to the American Dental Association, and to such an extent is this true that it seems unreasonable and against the best interests of the profession that this separation should be longer continued, and we most urgently request those to whom the matter was specially committed that they move forward in their efforts for this accomplishment as promptly as circumstances will at all permit.

## Ohio State Dental Society.

The annual meeting of this Association will be held on Tuesday, December 4th, in Columbus. Though we have not the full programme at hand we are assured the Executive Committee is using every effort to make this a large and interesting meeting. A good programme is well nigh completed.

This society always has for consideration a number of subjects of interest to the entire profession of the State; and in order that these may be properly considered and acted upon, for the largest interest, it is important that, at least, all the better and more representative part of the profession be present.

The question of a Tri-State meeting, which was initiated at the last meeting of this society, has met with a hearty response on the part of Indiana and Michigan, and that meeting to be held in June, 1895, promises to be a very large and important one.

A report of the General Committee, having that matter in charge, will be made at this meeting of the State Society, and there will doubtless be many details to be considered and arranged, for that occasion; and it is very desirable that the profession of Ohio should be made entirely aware of all the arrangements, and the earnest interest and co-operation of every one elicited for that occasion.

There are some other questions of great importance that are, or should come up, for consideration at this meeting.

We hope to meet every representative man of the profession of Ohio in Columbus at this meeting.

## Dental Colleges—Opening.

Another year for dental college work has arrived. From information received from a large number of colleges it appears that the number of students in attendance is equal to, if not greater than heretofore. Some colleges have larger classes than ever before, and others about the same number, while some have a few less than heretofore; in the aggregate, however, the number appears to be an increase over any former year, and this, notwithstanding the adverse financial condition of the country, and also in addition to the fact that there is a larger number of colleges in the country than ever before, and also that the requirements for entrance have been increased and the course of study lengthened, and in many instances the curriculum extended. In view of these things how is the increase in numbers to be explained? Is it because the practice of dentistry is more attractive than ever before, and so more inviting, or is entrance into other professions less attractive? It is hardly probable that the latter has much, if any, influence. There is doubtless a better appreciation of the value of dental service and understanding of its capabilities than heretofore. From this, of course, arises a larger demand. The increased requirements and more extensive curriculum necessarily attract the attention of a more highly-educated and better class of students. This we have regarded as an argument in favor of higher requirements, and it would seem, those having charge of our colleges are becoming more fully aware of this fact, and now more readily concur in arrangements calculated to elevate dental education.

During the agitation of these questions the statement was frequently made that extending the time for graduation and raising the requirements for admission would keep back many who would otherwise attend college. This is undoubtedly true; many who formerly were admitted to dental colleges, and some who enter even now, ought to be excluded. While it is true that many are now kept back who would come in under less rigorous requirements, a larger number who are prepared according to the present requirements and are far more appreciative apply, and are admitted, as is fully proven by the largely increased numbers now in attendance over that of former years; and it is not extravagant to assume that if the time was still further extended, the curriculum enlarged, the entrance requirements raised, and the requirements for graduation made more stringent, the numbers would be still further increased and the class of students improved.

This question is now prominently before the educators of our profession, and it is to be hoped that they may clearly see the way open for progress, in all these respects, in the near future.

THE DENTAL REGISTER.

Vol. XLVIII.] DECEMBER, 1894. [No. 12.

# COMMUNICATIONS.

## Dentistry Among the Speechless.

BY CHARLOTTE E. BENTON, D.D.S.

In the part of New York City called Washington Heights, overlooking the Hudson, is the group of large buildings known as the "New York Institution for the Instruction of the Deaf and Dumb." Ample provision is made for the teaching, health and general well-being of the pupils, who number about four hundred.

A year and a half ago a dentist was added to the staff. This innovation was for a time looked upon by the pupils with little favor, but after each pupil had been summoned to the dreaded chair and every obnoxious root removed, the dismay subsided somewhat. As the filling progressed and the consequent relief from pain was experienced, the silver lining of the dubious cloud became apparent and the path of the deaf mute did not seem so dark, even when it led to the dental chair. One of the buildings is called the "Mansion House," I suppose because it was many years ago the country-seat of a nephew of President Monroe. Its stately rooms are now the home of over eighty little boys all under twelve years of age. Their reception of the dental idea was amusing. Each, as he came from the hands of the dentist, turned loose once more among his fellows, was the center of an eager and somewhat anxious crowd. Twenty pairs of eyes looked intently at his open mouth, seeing each filling and noting especially any extractions which had been made, and their fingers flew too fast for any but a practiced eye to follow, asking all about how it was done. So well did they learn that more than once I was startled to see a child, who had never been in a dentist's chair before, tell me in signs that he preferred gold to gutta-percha, and suggesting not to use the engine.

*I love to fill children's teeth*, and I find them very good patients. The extraction was very conservative and every tooth that could be was made serviceable. This made about two hundred root-canals to fill during the first three months. During the fifteen months which have passed since, five of these teeth have given trouble. Two of them I was unable to subdue and they were extracted. Two others, upper molars, caused slight swelling and pain though not sufficient to keep the patient awake at night. A small fistula appeared from a buccal root and the symptoms disappeared, the whole trouble having arisen and subsided in forty-eight hours. The fifth was comfortable for six months when it gave pain. Removing the filling and a further portion of the crown of the tooth, one root was found not well filled. The canals were cleaned and refilled and the tooth has been all right for a year past. The canals are always kept dressed for a few days with an antiseptic adapted to the case, after the nerve is removed, before filling.

I have great faith in hot water and hot air as antiseptic and purifying agents. The root canals have been filled with gutta-percha, in one form or another, after drying them thoroughly with heated broaches.

The various diseases which have deprived the mute of hearing, have also lessened the sensitiveness to pain, and thirty exposed pulps were capped, hoping the effort might be more successful than with hearing and speaking people. Of these capped pulps nine have died. Probably the anæmic condition of many of the patients is one element against success. The capping was done at the same time as the root-canal filling. Quite a proportion of them had what are termed syphilitic teeth, or show the disease in the shape of brow and eyes. Adenoid growths and enlarged tonsils are common.

Children five years of age are admitted to the Mansion House for kindergarten training. When ten or twelve they go into the regular course of study which is eight years long. This gives a good opportunity of testing different methods with a chance to observe the results at any time. Nearly all cavities are lined with a non-conductor, usually gutta-percha, before filling, otherwise the pupils return complaining of thermal shock. Over two thousands fillings have been put in for them. But very few of these have failed as yet, and not one of these failures can I attribute to the presence of the gutta-percha.

Of cases which I do not understand I will mention these. A little girl erupted the lower bicuspids of the left side of normal appearance, but the first began to loosen before it had been in place six months. Then a brown spot appeared on the distal side of the crown, and the gum was inflamed by the irritation of the loose tooth. Last June the child went home. Returning to school this Fall, I found the tooth gone, and the process also—the space like a jaw from which the teeth have been gone a long time. Replying to my questions, she signed to me that it did not hurt, but was "weak" and a man pulled it out. The deciduous molars of the right side are still in place. The remaining bicuspid is not affected.

A young man came up saying he wished to see me the day before, as he was suffering very much, but I was not there. The lower jaw was badly swollen on one side opposite the molars He said it was the gum which pained, not the teeth. Examination showed he was correct. The mouth was packed with cotton and the swollen portion wiped dry. It was hard but not red. Pressure caused an exudate of a turbid, yellow fluid, resembling bile, coming from the substance of the gum, not from the tooth socket.

I did not treat it. In three days the symptoms disappeared. The patient has good teeth and good health. Another young man with large, strong teeth, has the upper molars exposed almost to the bifurcation of the roots. I cannot discover any pus or unhealthy state of the gums, and the teeth are not loose.

The front and all the lower teeth are normal.

# Bridge-Work.

BY A. W. HAIDLE, D.D.S.

Read before the Detroit Dental Society, November 12th, 1894.

In what cases is bridge-work advisable and how should the piece be constructed? These questions are of vital importance to the dentist of to-day.

In these closing years of the nineteenth century, when our many colleges are sending out such hordes of young men, nearly all of them fully qualified for performing this class of operation, even the most casual observer must have noticed that it is being used indiscriminately.

The public has become so well informed on this subject that when the patient presents himself with a number of teeth missing, the usual question is put to the dentist, "Can't I have a bridge put in there?" What follows?

The patient is in most cases dismissed in a happy frame of mind, with a piece of bridge-work in his mouth, and minus several dollars.

Why do we find this condition of affairs—this universal cry for bridge-work? Why this servile catering to the demands of the public on the part of the dentist? Is it a healthful condition, and if not how can we best improve it?

In answer to the first question, as to why there is so great a demand for bridge-work? I should say that the demand is a result chiefly of alluring notices in the newspapers, and signs on the windows of some of our practitioners. It is also the result of a feeling of repugnance toward wearing a plate, and a desire for something less cumbersome and more cleanly. This feeling and desire comes quite naturally to those who have already worn a plate, and to others because of a better education among the general public in matters pertaining to the care of the teeth.

To the second question I should make answer by saying, that the dentists accede to the demands of their patients, whether the demands be consistent or otherwise, for several reasons.

Enumerated, they may be stated to be as follows: First, the dentist has before him the prospect of a larger fee for the insertion of bridge-work than for the insertion of an ordinary piece of vulcanite; secondly, if his patient demands bridge-work, he dare not refuse the demand for fear of incurring the displeasure of the patient, and for fear of losing both the work and the patient; and lastly, there is often a desire on the part of the dentist (but mind, I do not say it is not a laudable desire), to display his skill, an ambition to furnish his patients with a higher grade of work, and to become, and to be acknowledged as an expert in this particular branch of dentistry.

Is this a healthful condition, and if not, how can we best improve it?

I should say that it is not a healthful condition. Many bridges are inserted where the conditions plainly indicate a plate; many are improperly constructed; many do not have a sufficiently secure anchorage, and some are not cleanly. We can improve this unhealthy condition by following the dictates of common sense. Let us be more conservative. Let us be certain that a bridge will be the best thing to insert in each particular case before inserting one.

What conditions indicate the insertion of a bridge, and how should the piece be made?

Where one, two or three teeth are missing among the molars and bicuspids, and where the anchorage is secure, one may be put in, provided always that sound teeth are not injured or endangered. If the four incisors have been lost, or any one or two or three of them, a good piece may be made under favorable conditions. Five or six teeth may be attached where there are more than two anchorages, though so extensive a piece of work is rarely advisable. Various other conditions might be mentioned but it is unnecessary.

A number of points however are to be observed in the construction of a bridge.

Always have sufficient and secure anchorage. The attachment of the piece to the anchorage should be strong and durable. Never hesitate if a portion of a sound tooth is to be sacrificed, to sacrifice the whole tooth by cutting away sufficient tooth substance to permit covering of the entire tooth, especially if it be a second bicuspid or one of the molars. In such cases it is better to do this and so protect the tooth from future decay, than to leave it partially exposed by using a band attachment to the then new and favorable conditions for decay.

Where a band attachment is to be made use of, it is always better to make the band at once broad and strong, for with a weak and narrow band the patient will be sure to return and much worry to the operator will result.

Always protect the grinding surfaces of the molars and bicuspids and the cutting edges of the cuspids and incisors with at least one thickness of gold. Never insert a bridge which will prevent the thorough cleansing of the piece itself, and of the surrounding and underlying parts.

In conclusion, unless a bridge is decidedly indicated I should always advise a plate, and advise one having a metallic base, for if the patient can financially afford bridge-work he can equally well afford a plate with one of the noble metals as a base; a gold plate, or one of continuous gum.

# PROCEEDINGS.

## The American Dental Association.

Thirty-fourth Annual Session, at Old Point Comfort, Va., August 7th, 1894.

Reported for the DENTAL REGISTER by Mrs. J. M. Walker.

[*Continued from November Number, page* 564.]

### ETIOLOGY OF DENTAL CARIES—DISCUSSION.

In the discussion of this paper, DR. FRANK ABBOTT said that it was always interesting and instructive to listen to a paper from Dr. S. B. Palmer; that he always brought forward absolutely original ideas and that there was very much in them that should be canvassed carefully by the Association. He had nothing to add to what had been said as to the electric theory of caries. He had placed himself on record upon that question years ago. As to thoroughly drying root-canals, he had long ago given that up as a bad job and does not attempt to dry them in any way, shape or manner. As to the use of essential oils in the canals Dr. Palmer knew what he was talking about in what he said about that. Wash them out with an aqueous solution of bichloride of mercury, 1 in 10,000, and fill. We formerly treated and overtreated and treated to death, but we have learned that filling the canal is the therapeutic means of cutting off the supply of irritating material. When all irritating material is cut off by a proper filling the wound will heal, even with a cyst at the end of the root. Shut off the source of supplies and it will disappear, with the application of a counter-irritant to the gum. Spending time and trouble in trying to dry out a root-canal is of no earthly good, and it is folly to spend hours in the vain attempt.

DR. J. Y. CRAWFORD: All have seen the condition where there is a lump at the end of the root, which may be either a pus-sac or a nucleated semi-fibrous cyst. If it is a pus-sac what becomes of the pus after the canal is filled?

DR. ABBOTT: There is no way of ascertaining the contents of the sac except with the exploring needle—but absorption does take place; without puncture or destroying it in any way, it simply disappears. If pus it may perhaps degenerate and be absorbed.

DR. JNO. S. MARSHALL: Many of the gentlemen here have been born into the profession since Dr. Palmer's first papers on this subject were read, but at that time it was my good fortune to be a near neighbor of Dr. Palmer, and it was with great pleasure that I saw going on the experiments which gave rise to the opinions expressed in the paper. In those days men said harsh things about the New Departure, but it has created great changes in modes of practice, and how many now put a pellet of tin at the cervical border of gold filling and save teeth decayed at the cervical margin by filling with amalgam, and the honor is due to Dr. S. B. Palmer. All chemical elements are either positive or negative; all matter the same, even in our foods one is positive and the other negative, and it is for this reason that certain foods are eaten with stronger zest if taken in pairs; the familiar ham and eggs for instance, or roast turkey and cranberry sauce. The saliva connects the two poles. This has been tested and proven by the actual deflection of the needle of the galvanometer. These things have a practical value. We all fill the roots of teeth, but we do it blindly, and not on scientific principles. Try his experiments, and I feel confident that you will get the same results that he does.

Dr. A. W. Harlan wished to ask Dr. Palmer how the essential oils are oxidized in the root of a tooth, and how gutta-percha is oxidized in the root of a tooth. If gutta-percha is an oxidizable substance why was it chosen to cover the great Atlantic Cable? Methods of filling roots of teeth do not properly come under this section. The use of tin at the cervical margins of gold fillings was not introduced by the New Departure men. It was in use for thirty years before the New Departure was born. The experiments of Miller, Black and others prove that this electro-chemical theory of the production of caries has no ground to rest upon. Decay is the result of the agency of micro-organisms through their excretory products. The electro-chemical theory of decay is not proven, but the experiments of Miller will stand until something more definite shall have been demonstrated before scientific bodies.

Dr. Marshall: The theory set forth by Dr. Palmer does not in any way antagonize the experiments and conclusions of Dr. Miller. His theory only relates to what is called secondary decay, the result of introducing metal fillings into teeth of low grade, of soft texture, when from excess of moisture a battery is established in the tooth. He claims that secondary decay is not accounted for in any other way; that it is not always due to faulty manipulation; there is something else that causes that breaking down of tooth structure at the cervical margins of the finest gold fillings. The operation may be as perfect as possible, the gold carefully packed and the filling finely finished, and yet secondary decay occurs—this is the reason, why these failures occur. Dr. Palmer does not claim to have been the first to use tin as described, but I do say that he is the first to give a scientific explanation of its protective value, and he is entitled to that credit.

Dr. A. W. Harlan: That there may be no misconception of my position I claim that the agency that produces decay in the first place produces it in the second, and that the electro-chemical agency has nothing whatever to do with it. If primary decay is due to micro-organism so also is secondary decay. Gold properly inserted in a tooth does not oxidize; it is not soluble.

Dr. J. Y. Crawford: I ask Dr. Harlan, as a therapeutist, which pole attracts acids and which pole attracts alkalies? and I ask him to answer definitely.

Dr. Harlan: I do not know what you seek to obtain.

Dr. Crawford: I have heard an interesting exposition on electricity and it was stated that one pole attracts acids and the other alkalies. Having the negative pole on one side and the positive on the other, medicinal agents are passed through using a battery. Placed on any part of the organism one pole will accumulate acids and the other alkalies. If that is a scientific truth, there is more in the theory of electric influences as a factor in producing caries than we imagine. Dental caries, *per se*, both primary and secondary, is fundamentally the same. There may be many factors in the production of caries but the specific result is the same. They do not act alike, however, under all circumstances and in all environments. If the electrical influence is acid at one pole and alkaline at the other, it may be that it has an important factorage to that effect in dental caries. I believe in making our record as we go along, and I place myself on record here as saying that I believe that the uses of the amalgams have been more hurtful to the human family than beneficial.

Dr. Louis Jack: A few words in explanation of my own inability to accept Dr. Palmer's electro-chemical theory in causing decay of the teeth. It seems to me if that were true that all margins of fillings would have a tendency to decay alike. Because the majority of defects, or secondary decay, occur at the cervical margins, the theory or hypothesis appears to be proven to the minds of a large number of the profession. But Drs. Miller and Black account satisfactorily for the recurrence of decay from the conditions which exist. If we accept the views of Miller and Black we do not need the electro-chemical theory.

**Dr. Abbott**: One point has not been made clear. If a filling in a tooth is equally perfect in all parts and well finished in every respect, how is it possible for any action to occur between the dentine and the filling, whether electrical or of organisms. The truth is it is all due to imperfect manipulation. There must be something to dissolve the lime salts to start caries. Whether the acids producing this result is due to electricity or to organisms or to some acid substance in the mouth, the final result is the same, so it makes but little practical difference. Dr. Palmer's idea is a good one. It is very feasible that an electric current is passing from a defective filling to the tooth and returning, and that acids are generated. I am not willing to decry the theory for I think there is a great deal in it.

**Dr. Bogue**: Can Dr. Abbott tell us how long that battery will act?

**Dr. Abbott**: It will never cease as long as the proper conditions exist.

**Dr. Palmer** closed the discussion with a further elucidation of the principles involved, and the subject was passed.

**Section VI** further presented the "Final Report on the Examination of Human Crania," by Dr. J. J. R. Patrick, which at the request of the author was read by title, and also a review of Dr. E. S. Talbot's work on the "Etiology of Deformities of the Head and Face, Jaws and Teeth."

### SECTION VII.

Reported two papers, one on a "New Operation for the Extraction of the Trigeminal Nerve," by Dr. T. W. Brophy, for the relief of neuralgia, which has been successfully performed in three cases. In this operation the foramen is enlarged from above downward, enabling the operator to carry a slender curved drill along the line of the canal, the finger of the left hand recognizing the presence of the drill before it passes through the soft tissues, the contents of the nerve canal being removed more easily than that portion of the dental pulp, which is in the root of the tooth. The operation is especially commendable, in that there is no division of the external tissues, and no hæmorrhage.

In reply to a question, Dr. Brophy said, that the first of these three operations had been made in April, and there had been no recurrence of pain.

Dr. John S. Marshall does not think that sufficient time has elapsed since the operation to pronounce that there will be no recurrence. There may be relief for a year even, and then it may have to be done over again, and perhaps three or four times. As much as three inches of the maxillary nerve has been removed, and yet there will be a reformation unless we reach its peripheral origin. The source of the trouble may be in the ganglion in the brain, or from some spicula of bone pressing on the nerve. Relief in these cases is only temporary, and the same conditions will recur when the nerve tissue is built up. There is no cure. But this is an easier way than the old method, and it does not disfigure the patient, but he would expect hæmorrhage in some cases, necessitating ligating the inferior dental artery.

Dr. Patterson asked what he would do in case that long, slender instrument were to break.

Dr. Brophy: If the instrument is properly tempered it is not likely to happen; but if it did, it would be necessary to remove the maxillary plate, and remove both the instrument and the nerve, but he hoped it would never happen. Dr. Brophy does not think there will ever be a recurrence; the inside of the canal being reamed out by the instrument, bone will be organized from the deposits of plastic matter, and the canal be filled up. There will be no recurrence if the source of trouble is attainable. In one case he found the source of trouble to be, that the nerve had three or four times its normal volume, and appeared as if it had been ligated at the foramen.

A paper by Dr. Wm. N. Morrison, St. Louis, on "Planting Teeth," was next read.

This paper reviewed briefly Dr. Morrison's practice in this line for the past eighteen years, during which time he had not had one unfavorable or dangerous symptom.

Most of the cases reported at the "Centennial," in Philadelphia, have "gone over to join the great majority," but a few are still acting well their part. In his earlier experience he deemed it essential that the tooth to be planted should be *fresh*—not more than twenty-four hours out of the mouth, but since Dr. Younger has demonstrated the value of dry specimens, the operation has been greatly facilitated, though freshly-extracted teeth are preferable. This subject has not yet been thoroughly investigated from the physiological and pathological standpoint. There seems to be an aversion to bringing it up for discussion. When asked why odontoblasts attack promptly the roots of some planted teeth, while others have remained intact for from twelve to fifteen years, no rational or intelligent answer has been given. An unhealthy, neglected mouth, with the soft tissues in a tumefied condition encourages this retrograde metamorphosis. Physical culture results in the prevention of all classes of microscopic organisms that work destruction in the mouth. Dr. Morrison says: I have accidentally stumbled on the fact that massage treatment with the ball of the finger and the bristles of the tooth-brush, over the whole plate of the alveolar process, exerting a friendly friction several times daily, with frequent rinsings with warm water, this will preserve the root of the tooth for a long time, and the patient who thoroughly follows this method will rarely lose a planted tooth.

Dr. Morrison then gave the history of a number of cases of teeth planted from two to fifteen years. One remarkable case of which the early history is on record in the "American Transactions for 1875," is still in good condition, having done good service for nineteen years. It was apparently a desperate case in the beginning. The patient was a lady then forty years of age, of delicate constitution and anæmic habit; the condition of the gum was bad, and receded from this tooth so that a thin broach was easily passed beneath the gum. There was a large decay in the distal surface—had exposed the pulp—having an oxychloride filling, and another decay below this filling. The pulp in the posterior root was dead, but in the anterior root and the body of the tooth it was alive. The patient was anxious to save the tooth, but was not able to stand the necessary operation. The tooth was removed, the roots and crown cavity filled, out of the mouth, deposits of tartar removed, and the tooth returned to place. For three or four days the patient experienced considerable pain, but in a few weeks it became comfortable, and in five months it was the firmest tooth in the arch—which is unbroken. That was the report made in 1875. The tooth was seen recently (1894), and is still in good condition.

Another case reported, was of a tooth which had been replanted by another dentist. A gutta-percha filling had expanded and cracked off the labial face of the crown. The palatine portion and the root being firm, a metal crown was adjusted, but this broke off from too strong occlusion. The implanted root was then removed, and another tooth planted April 26, 1890, which is a magnificent success. In another case a tooth was planted in 1879, which did good service for fourteen years, when a successor was planted in the socket, which is giving satisfaction.

## OPERATIVE DENTISTRY.

The report from Section III. having been deferred, both Chairman and Secretary being absent at the morning session, on Friday, **Dr. S. G. C. Watkins** stated that no written report being forthcoming from this Section, they could only present some new appliances which the Section deem worthy of consideration.

**Dr. Chas. Sill**, New York, offers a "Traction Engine," designed for the adjustment of sub-cervical bands on over-jutting teeth, over which shell crowns can be telescoped, avoiding cutting away the enamel in shaping the teeth, as in the ordinary methods.

**Dr. J. N. Crouse** (for the Dental Protective Supply Co.) offers a new engine bur, which cuts when pressure is straight ahead, as well as with lateral pressure; the blades are also so placed as not to clog. Also a new engine and a new hand-piece, which are worthy of consideration; absorbent pads to be used in the mouth instead of napkins; they are antiseptic, very absorbent, and convenient in size and shape; also a new zinc-phosphate, "Lithós," a slow-setting, dense cement, with which very fine work can be done.

Of this cement, Dr. C. N. Peirce said: This is a pyrophosphate, and on account of the great amount of heat to which it is subjected in the course of manufacture, it is less soluble in the mouth than the cements in general use.

No remarks being made on the subject of Operative Dentistry, Dr. Harlan, Chairman of Section V., "Materia Medica and Therapeutics," announced the report from this Section, which was made by the Secretary, Dr. Geo. E. Hunt. The report was a brief resume of the value of Schrier's preparation of "Kalium Natrium;" of Dr. Callahan's method of opening root canals by the use of Sulphuric Acid; of the value of Pyrozone in the treatment of Pyorrhœa Alveolaris; of Milk of Magnesia in Erosion.

Dr. A. W. Harlan stated that after twelve years service as Chairman of Section V, he now voluntarily retired in favor of Dr. J. S. Cassidy, Covington, Ky. Dr. Harlan reviewed the advances made since 1880 in this branch of dental science. Prior to that date it was included in the curriculum of but one dental college, now it is compulsory in all. He attributes this largely to the work of Section V, of the American Association. Previous to that date, dental treatment was almost entirely mechanical, the few drugs in use being used empirically. Now the internal administration of drugs and the use of antiseptics is an important and essential feature in the treatment of diseases of the antrum, of the dental pulp, and of the oral mucous membrane. All this is evidence of the attainment of advanced knowledge. Among the valuable new remedies mentioned by Dr. Harlan is *alumnol*, an astringent of great value. In the treatment of pyorrhœa pockets, four to seven grains of alumnol, dissolved in water, to which one drop of oil of Ceylon cinnamon is added, injected daily around the roots of the affected teeth for two or three weeks, will cause the pockets to fill up with new growths. This may be preceded by a dilute solution of trichloracetic acid daily for a week, followed persistently by the alumnol injections. In oral catarrhal conditions, nitrate of silver is valuable as a styptic, astringent and stimulant, the objection being the blackening of the tissues. In deep pockets it forms a coagulum before reaching the deepest parts.

The local treatment of pyorrhœa must be based on the theory of micro-organisms, and if the origin is not clearly local, constitutional treatment must be added. The use of pure drinking water in large quantities has a beneficial effect on all mucous surfaces. Gum-massage daily, using 40 grains borax to 1 ounce linolin, to which an essential oil may be added for piquant taste, and a little tannic acid in case the gums bleed, will be found of great assistance.

Dr. Cassidy called attention to a remedy recently introduced, known as "Formalin." It is not a secret nostrum, though given this proprietory name.

Used in root canals it embalms permanently any contents that cannot be removed. Muscular tissue is perfectly cooked by one immersion, forming a homogeneous mass similar to horn. If the yolk of an egg is treated by formalin, no sulphuretted hydrogen is apparent. It is readily absorbed by water, from which the escaping gas is absorbed by solids, as cotton-wool, lint, etc. Absorbed by porous solids, as cakes of pumice, etc., and placed in drawers, it will be valuable in sterilizing instruments, etc., keeping them permanently sterilized. Formalin has been in use too short a time to pronounce positively upon its use in the mouth, but from its known action elsewhere it promises much.

Section V. passed.

Dr. Boice, Secretary of Section I. announced as a supplementary report, a paper from Dr. Wm. N. Morrison, St. Louis, on "Bridges."

The paper was read by title.

### SECTION IV. HISTOLOGY AND MICROSCOPY.

Dr. Frank Abbott, Chairman. No report.

### ADDENDA FOR PATHOLOGY.

Dr. S. H. Guilford: An interesting case in pathology was overlooked when Section VII had the floor. The case was reported to the Odontological Society of Philadelphia by Dr. Gaskell.

Dr. Gaskell: The case is rather unique. The patient presented some two and a half years since, showing a peculiar pinkish spot on the central incisor, showing the same on the labial and palatine walls. The tooth was perfectly sound externally; there had been no irritation and no soreness. As no cause for the appearance was discernable, I advised waiting, thinking it might disappear spontaneously, as it had appeared. But in about six weeks' time the palatal wall crushed in, and the crown was found to have been but a mere shell, the enamel wall of the labial surface being so thin that an instrument could be plainly seen through it. This spring the patient presented with a recurrence of the same thing in the other central incisor. This was shown to Dr. E. C. Kirk. He suggested systemic treatment with iodide of arsenic. I opened into the tooth and found the pulp in normal condition, with perhaps a slight deposit of lime salts, but scarcely perceptible. The pulp was perceptible through the palatine and labial walls, having the appearance of a pink gutta-percha filling inside of very thin enamel walls. After a time there seemed to be a filling up again with a marked decrease in the pink spot. The patient was a college boy about twenty years of age, and in good health. A sample of his blood was examined microscopically and found to be perfectly normal. I would like to have some light thrown on this peculiar phase.

Dr. Jack: My son has had a similar case, and forty years ago I saw a case of the same character. The dentinal substance seems to have been resorbed. The spot in this case was closest to the outer wall of the tooth at the inner or mesial aspect, extending above the margin of the gum. In the more recent case, in my son's practice, he did not consult me, but at once drilled into the tooth, destroyed the pulp, and filled the root with gutta-percha and oxide of zinc. The tooth was perfectly sound and had had no previous treatment. I saw both of the cases described by Dr. Gaskell. The pink spot was very apparent, and as I remember, like the one I saw forty years ago.

Dr. Frank Abbott: This makes five cases of this very peculiar absorption of the inner portion of the tooth, and all reported from Philadelphia. Apparently none have been heard of, from any other place. I have never seen such a case, never heard of anything resembling it. There are but two solutions of the question. Either there must have been some minute external opening into the tooth, through which acids penetrated, creating an irritation of the pulp, causing absorption of the dentine—though how this could possibly have gone on to the extent described is a mystery; and how the lime salts were taken away is another mystery. I do not see how it could have been brought about. The dentine must have been destroyed in a manner similar to the removal of the roots of the temporary teeth when they are absorbed—a dissolving out of the tooth substance. It would seem as though there must have been some irritant in the circulatory apparatus, though if that were the case I do not see why the bones all over the body were not affected and the patient left limp like rubber. That a substance that is harder than any other portion of the body could be dissolved out from the inside of the tooth till the walls were left so thin that they could be seen through, without the presence of any acid to dissolve out the lime salts, with no apparent source of irritation to cause it, is a mystery which is hard to solve, figure it out as best you can.

DR. JOHN S. MARSHALL: It can only be explained on the hypothesis of a retrograde metamorphosis of tissue, as the roots of living teeth are sometimes destroyed, the action of osteoclasts in the dental pulp, removing the tissues. The one is as difficult to understand as the other.

DR. ABBOTT: By a reversal of the process by which the tooth is built up the lime salts are dislodged and thrown down, dissolved, taken up in the circulation and carried off. I cannot conceive of such a special organ as that called osteoclast—a supposed body, whose peculiar function it is to dissolve lime salts and destroy bone tissue. There are no such things as osteoclasts, but there must have been some irritant. I never heard of these cases except in Philadelphia, but there are many peculiar diseases there never heard of anywhere else.

DR. MARSHALL: I stick to the osteoclasts as offering the only explanation. There may have been some preceding shock, perhaps excessive heat or cold to start the irritation, and the subsequent formation of osteoclasts furnishes a satisfactory explanation.

Dr. Abbott: Will Dr. Marshall please explain what an osteoclast is, and where it comes from?

Dr. Marshall: I don't know what an osteoclast is, or where it comes from, but I do know we find what we call osteoclasts.

Dr. Gaskell: I would like to ask what became of the osteoclasts in the case in which treatment was successful?

Dr. Marshall: Osteoclasts are not supposed to work on forever. After they had scooped out the inside of the tooth cementoblasts took up their work and began to fill up that space.

Dr. B. Holly Smith: This reminds me of an anecdote told by Henry W. Grady: Some boys, in a spirit of mischief, pasted together some of the leaves of the Bible in a country church, and when the old preacher read the chapter, he read: "And Noah took unto himself a wife, and she was forty cubits long, and forty cubits broad, well tarred inside and out with pitch." The old man closed the Bible and reverently said: "My brethren, I never observed that passage before, but I believe everything that is inside the cover of this Holy Book. Verily, man is fearfully and wonderfully made!" And so it was with those Philadelphia incisors.

Dr. Palmer: I seldom present anything that I have not demonstrated, but I will offer a suggestion. In discussing a question of this character, we should first consider nature's process in the construction of the living body, and the results of a possible reversal of this process. Circulation being cut off, the current is turned back. No outside exposure is necessary to produce decay below a filling. From irritation of some character, the lime salts are dissolved and carried off, or, on the other hand, lime salts may be deposited and the pulp cavity be filled up. If acids are present it will not fill up, but with a non-irritant, non-conductive substance as gutta-percha, nature may produce currents which will fill up the space. Nature can build up or pull down, according to conditions. As nature deposited the lime salts, nature can re-absorb them, though we cannot say how. We cannot account for this reversal of nature's process.

Dr. Jack: It *is* remarkable that these five cases (I know positively of four) should all have occurred in Philadelphia. The pink appearance was of a higher grade of color than the normal pulp, and the destruction of tissue was very great. In the two cases of Dr. Gaskell's, there was perfect symmetry of the lateral and lingual surfaces of each tooth.

Dr. B. H. Smith: What was the character of the internal surface of the cavity?

Dr. Jack: It was regular and even, with no bay-like excavation, but regular, as if made with a round burring instrument.

Dr. Crawford: I doubt if this could be called hypertrophied pulp. I should call it pulp transformation. The pulp, instead of continuing its work as a tooth builder, became a tooth re-absorber or remover.

Dr. Crawford described a case in which the roots of a right superior sixth-year molar were quite devoid of bony tissue, the living pulp having acted as a tooth destroyer.

Dr. Gaskell had inquired carefully into the precedent history of the cases he described and there had been no irritation, not the slightest soreness. When he removed the pulp the root canal did not show any marked increase in size, though the apical foramen was slightly larger than normal. The pulp was very vascular. It was all removed at once with the aid of cocaine; styptics had been necessary to arrest hæmorrhage.

Dr. Ottofy: Those who invented the theoretical osteoclasts, to account for the peculiar conditions leading to the absorption of the deciduous roots, have never seen one. The theory is defunct, and there was never any necessity for it. The blood stream is a sewer as well as a purveyor. Much useless matter is removed through the blood stream, and there is no reason why dissolved dentine could not be removed in that way. Particle by particle the carbonate and phosphate of lime is brought to the root, and it can be carried away also, in solution, very finely divided, carried off through the blood channel.

Dr. T. T. Moore: I have had a case of this kind, a gentleman 45 or 50 years of age, though it is rare in the human species. There was no decay; the tooth had never had a filling—I had examined the teeth a number of times, but could find nothing wrong. He said he felt impelled to grind and crush his teeth together, and it worried him. I examined most thoroughly, even with the electric light, but could find no external cavity, though I separated the teeth, as he located the trouble between the first and second bicuspids. When he came again one of those teeth had crushed in, and it cut like old cheese. I wrote to the late Dr. Wm. H. Atkinson about it. He said it was a case of liquefaction of the dentine; that it had been decalcified and taken off by the pulp. The same thing recurred in five of his teeth. Nature is busy all the time. She builds up energetically; but when her work is complete she does not remain idle but begins to tear down again. I could find neither systemic nor local cause in this case. It is a singular fact however that the patient could never pare his nails, but had to use a file. There may have been some systemic trouble shown in this relation between the teeth and the nails.

Dr. Abbott: Dr. Gaskell opened the book a little for us when he said that he found the foramen enlarged, and that it was difficult to stop the hæmorrhage. It is fair to presume that through this enlarged foramen there was a larger flow of blood than normal, and the pulp being over-nourished became an irritant liquifying the dentine, the lime salts being taken up and carried away. That one statement opens the way to a reasonable explanation.

Dr. Patterson has had several cases where, though the finest probe failed to reveal any external opening or source of irritation, yet after extraction, closer examination showed such imperfect tooth structure as to prove that the irritation of the pulp came from the outside as surely as though there had been caries. In fact in one case he found quite a large internal cavity, with no opening to the outside that could be detected by the finest instrument. Under a strong glass, however, he found such imperfections in the enamel as to prove that the pulp irritation was directly from outside sources.

Dr. McKellops: I would be glad if any one can tell me how to diagnose an ossified pulp. It is often the cause of intense suffering, when the teeth are, to all appearances, perfect. Extraction offers the only remedy, and then we find an ossified pulp. I will ask some one to tell us how to diagnose this source of suffering.

A patient ten years old recently came to me with a small abrasion of the enamel, near the gingival margin. Another dentist had applied arsenic and the tooth had turned perfectly red. I took it out and found the pulp ossified.

DR. CROUSE: I second the question of Dr. McKellops. Will some one tell us how to diagnose ossified pulps so that we may know when that is the cause of pain. I have a case where I could find no cause for severe suffering, which gives a nervous reflex action all over the mouth, but by tapping on the teeth, I found one tooth a little more sensitive than the others. On that indication, I have removed three teeth in one mouth, and found ossified pulps, and I now suspect another.

DR. GASKELL: It is better to drill into the tooth and find out. Extracting the tooth is like cutting off a man's head to save his life.

DR. BROPHY: With the aid of an electric incandescent light, in a darkened room, you can nearly always determine whether the pulp is calcified or not. An unusual degree of opacity is seen in a tooth so affected.

DR JNO. S. MARSHALL: This is one of the most difficult things to diagnose. We can only conclude, if there is no other possible cause this must be it. Unless we resort to the drill as suggested, but we do not always know which tooth to drill into. The only way is by the process of exclusion. If we cannot find any other symptom it must be ossification. In young persons, if there is a spicula, the pain will be increased by anything which increases blood pressure, as by rapid walking, bending over, causing the blood to run to the head, anything causing extra pressure on the arterial system—causing expansion of the pulp. This may help you some times.

DR. ABBOTT: What causes ossification of the pulp? Why does it occur? What is the origin of the trouble? Let us all think this subject over during the coming year, and talk it over again at our next meeting.

Dr. McKellops protested against passing the subject of Operative Dentistry simply because the Section offers no report. He said : "I would like to ask what we, as a profession, make our living from ?" By Operative Dentistry, at least ninety per cent. of it, and yet we have no report and no discussion of the subject in which we are practically most interested—that by which we support our families. Give these young men the benefit of your experience on this, the most practical part of dentistry—that by which they must make their living.

The subject was passed, the time set apart for elections having arrived. Asbury Park was selected as the next place of meeting, on the first ballot.

### OFFICERS ELECTED.

J. Y. Crawford, Nashville, Tennessee, President.

S. G. C. Watkins, Mont Clair, N. J., First Vice-President.

Thos. Fillebrown, Boston, Second Vice-President.

Geo. H. Cushing, Chicago, Recording Secretary.

Emma Eames Chase, St. Louis, Mo., Corresponding Secretary.

Henry W. Morgan, Nashville, Tennessee, Treasurer.

C. N. Peirce, H. A. Smith, T. S. Waters, L. Ottofy, Executive Committee.

### DENTAL PROTECTIVE ASSOCIATION.

At the request of Dr. J. N. Crouse, a committee of three from the American Dental Association and two from the Southern Dental Association, were appointed to examine the books and papers of the Dental Protective Association.

The committee consisted of Drs. H. A. Smith, Louis Jack, C. E. Esterly and Drs. R. R. Freeman and V. E. Turner, reported at a subsequent session that they had examined all of the books and documents submitted by Dr. Crouse, and found the funds fully accounted for, and the affairs of the Association administered with discrimination and economy.

### THE DISCOVERY OF ANÆSTHESIA.

On a resolution offered by Dr. J. D. Thomas, the following committee was appointed to take into consideration and report suitable measures for the celebration of the fiftieth anniversary of the discovery of anæsthesia by nitrous oxide, by Horace Wells. The committee consisting of Drs. J. D. Thomas, Philadelphia; Thos. Fillebrown, Boston; J. Taft, Cincinnati; Jas. McManus, Hartford; H. W. Morgan, Nashville; W. C. Barrett, Buffalo; A. W. Harlan, Chicago; H. J. McKellops, St. Louis; and T. E. Weeks, Minneapolis, reported a series of resolutions, enumerating appropriate features for the celebration, including two papers: one, giving the "History of the Discovery of Anæsthesia," to be prepared by Dr. Fillebrown, and one on "The Application of Anæsthesia to Surgery, and its Benefits to Mankind," which Dr. J. E. Garretson would be invited to prepare. Also that a banquet be given and prominent gentlemen to be invited to make addresses. All of these papers to be preserved in a memorial volume.

Philadelphia was selected as the place for the celebration.

An organization committee of nine, an executive committee of eleven, and a general committee of fifty were recommended in the report which was adopted.

Dr. Jas. McManus offered the following resolution, which was adopted:

WHEREAS, Papers printed in the magazines of the day are calculated to mislead the public as to the facts in regard to the discovery of anæsthesia;

*Resolved*, That the American Dental Association places itself on record, as it did in 1864, by affirming that the late Dr. Horace Wells, of Hartford, Connecticut, is entitled to the honor and credit of the discovery. The justice of Dr. Wells' claim was established by an official investigation before a committee of Congress. The testimony taken at this investigation is printed in a work on "Modern Anæsthesia," published in 1859; and in 1867 by the late Hon. Truman Smith, U. S. Senator from Connecticut.

### UNIFICATION OF DENTAL LAWS.

Drs. B. Holly Smith, A. W. Harlan and J. Y. Crawford were appointed a committee to confer with similar committees from other dental societies, in an effort to secure unification of the dental laws of the different States, and especially in regard to registration and license to practice dentistry.

### CENSUS CLASSIFICATION OF DENTISTS.

Dr. A. Boice called attention to the statements made in the transactions of 1892, in regard to the fight made on the census question. A great deal of work was done by men whose names are not mentioned, and who are entitled to credit in the matter. Drs. A. Boice, W. S. Twilley and C. A. Meeker, were appointed a committee to prepare a correct history of the movement, to report at the next meeting.

### FINANCE COMMITTEE WORLD'S COLUMBIAN DENTAL CONGRESS.

At the request of Dr. Jno. S. Marshall, Treasurer, a committee of two was appointed to examine the accounts of the Treasurer of the Executive Committee of the World's Columbian Dental Congress.

Drs. M. W. Foster and H. B. Noble, the committee appointed, reported that they had examined the accounts and vouchers of Dr. Marshall and found everything correct.

Dr. Marshall presented a detailed statement, showing over $14,000 received from foreign governments, State and Local Dental Societies, etc. Also vouchers for expenditures, showing, with bills paid and contracted, a deficit of about $1,000.

The Association voted an additional donation of $500, and before the close of the meeting, Dr. Marshall had raised $260 of the remaining $500, and hoped to receive the full amount, in order to pay for the Transactions now being printed.

### NECROLOGY.

The Committee on Necrology, Drs. J. Taft, C. N. Peirce, H. J. McKellops, Louis Jack, F. Abbott, reported suitable resolutions in memory of those who have fallen from the ranks during the past two years. The long list includes:

Drs. Geo. Watt, Xenia, Ohio.
W. W. Allport, Chicago, Ill.
W. H. Eames, St. Louis, Mo.
A. W. Rawls, Lexington, Ky.

R. B. Winder, Baltimore, Md.
Edgar Park, St. Louis, Mo.
Alonzo B. Beale, Philadelphia, Pa.
Ambrose Lawrence, Boston, Mass.
J. Smith Dodge, New York, N. Y.
W. C. Wardlaw, Augusta, Ga.
J. H. Smith, New Haven, Conn.
M. H. Dodge, New York, N. Y.
Fred A. Levy, Orange, N. J.
G. W. McIlhaney, Columbus, Ga.
G. A. Wells, Indianapolis, Ind.

### GENERAL ADDRESSES.

Dr. A. W. Harlan introduced a resolution, providing for two general addresses on some subjects of universal interest, to be delivered on the second and third days, respectively, of the annual sessions. The third division of the Executive Committee to name the subjects, and the first division to select the essayists.

The resolution was adopted, and Dr. A. W. Harlan was selected to deliver an address on "Antiseptic Surgery," and Dr. Louis Jack, one on "The Business of Dentistry."

### COMMITTEE ON STATE AND LOCAL SOCIETIES

reported that in the discharge of their functions, they had formulated a series of questions to serve as topics for discussion by the Local and State Societies throughout the country. An important part of the plan, was the anticipated reception of reports of these discussions, but only one such report has been received by the committee. They are still of the opinion that the scheme has its value, the dental journals showing that interest in the plan has been wide-spread, and that the topics suggested have furnished abundant material for study and discussion.

On motion, the committee was continued, with authority to promulgate another series of questions for discussion by State and Local Societies during the coming year.

### CONSOLIDATION OF SOUTHERN AND AMERICAN DENTAL ASSOCIATIONS.

Dr. Thos. Fillebrown said that a certain old farmer, being asked the best time to plant corn, replied: "When the ground is ready." He believes the ground is now ready for planting seed which will germinate, grow and bear fruit through closer union among the members of the dental profession, resulting in more rapid, scientific and professional advancement.

He moved the appointment of a committee of five to confer with the Southern Dental Association in regard to combining the two Associations in one National Association.

Drs. Thos. Fillebrown, B. Holly Smith, Louis Jack, J. Y. Crawford and J. N. Crouse were appointed on this committee.

The report of the

### COMMITTEE ON REVISION OF THE CONSTITUTION

was deferred for a year, and the committee continued, in view of the changes which will be necessitated, should the proposed consolidation be effected.

### TERMINOLOGY.

Dr. B. Holly Smith moved the appointment of a permanent committee, whose duty it shall be to prepare a system of terminology, to report progress, and be continued from year to year. The motion was adopted and the following committee appointed: Drs. S. H. Guilford, L. Ottofy, M. L. Rhein, Thos. E. Weeks, C. L. Goddard, L. D. Shepard, D. R. Stubblefield, Grant Molyneux, A. H. Thompson.

### PYORRHŒA ALVEOLARIS.

On motion of Dr. J. Taft, a committee of five was appointed for the investigation of the disease commonly called "Pyorrhœa Alveolaris," with the view of ascertaining the etiology, pathology and correct modes of treatment of this disease. The committee was authorized to draw on the treasury for a sum, not to exceed seventy-five dollars, for the necessary expenses of this investigation. Drs. C. N. Peirce, John S. Marshall, E. C. Kirk, M. L. Rhein and J. Taft, were appointed on this committee.

Association Adjourned.

# Vulcanizing Rubber.

BY DR. GEO. B. SNOW.

Read before the 38th Annual Session of the Michigan Dental Association.

Dr. Geo. B. Snow, of Buffalo, N. Y., presented some samples of vulcanized rubber, and showed what the physical changes are that take place in that material during the process of vulcanization. The samples, both by their change in shape and by their increased specific gravity, showed that their mass was perceptibly smaller after vulcanization, the change differing according to their composition; those composed of pure rubber and sulphur shrinking more than those containing a large percentage of foreign matter; the scale running from pure black to pink, the latter showing the least change. The difference in the specific gravity of the samples showed the change by vulcanization to run from about 6 per cent. for pure black rubber to about 3 per cent. for pink. Attention was drawn to the fact that the heretofore unaccountable mishaps which occur in vulcanizing, such as loose teeth, vacant spaces under the shoulders of bicuspids and molars, and under section teeth, are easily explained when the shrinkage of the rubber is taken into account; their occurrence being much more frequent in the use of black or pure rubber than the colored ones.

The subject of the expansion of rubber by heat was then taken up, and specimens were exhibited which showed that its expansion from 212 to 320 degrees is fully equal to its shrinkage in vulcanizing; the deduction following that if the flask was properly packed, and closed in hot water, it would contain rubber enough to make a sound plate if none of it were allowed to escape. As gate-ways are usually cut, a constant escape of rubber is going on while the vulcanizer is reaching the vulcanizing point, with the result that if there was no change in it by vulcanizing there must still be a deficiency in the mold when it cooled to the amount of the escape into the gate-ways. A strong plea was then made for the use of spring pressure upon the flask while vulcanizing, and it was shown that by cutting a circular overflow chamber around the mold, leaving a narrow edge of plaster around it perfect, so that the rubber would be imprisoned when the flask was closed, and by using spring pressure upon the flask in the vulcanizer, the necessary conditions would be fulfilled, and the results would be very much more satisfactory, both to the operator and the patient.

Two plates were shown, which were vulcanized in the College Laboratory at Ann Arbor, one in the ordinary way, and the other according to the process described. The two plates were counterparts, being made upon duplicate models, with section teeth set at a considerable distance from the alveolar ridge and mounted in black rubber. When vulcanized, a bicuspid block was broken from each in order to show the difference between them. The one vulcanized in the ordinary way had a space under the teeth, so that a Swiss saw could be passed under all of them, even to the molars on the opposite side and the pins of the broken bicuspid block were perceptibly loose in the rubber. The other plate showed the rubber to be in perfect contact with the teeth and the pins to be held firmly.

The changes in the plate after vulcanizing, by the contraction of the rubber in cooling were then noticed, and it was shown that they were much more marked when section teeth were used, on account of the very slight contractile power of the porcelain. The sections form an arch which diminishes in width by the contraction of the rubber inside it, with the effect of causing the plate to rock upon the hard palate. The plate is, in fact, a little too narrow for the mouth; and if it becomes necessary to re-vulcanize it, the difference is often perceptible, and lower plates, after successive repairs and re-vulcanizations, will become so loose as to be unwearable. It was shown that the difficulty could be overcome by heating the plate enough to soften the rubber while its heels were forced apart by a stay, thus widening the arch and restoring it to its original dimensions.

## Dental Law.

AN ACT.

To amend and re-enact sections seventeen hundred and sixty-seven and seventeen hundred and seventy-four of the Code of Virginia as amended and re-enacted by an act entitled an act approved January twenty-eighth, eighteen hundred and ninety, entitled an act to amend and re-enact sections seventeen hundred and sixty-seven and seventeen hundred and seventy-four, of chapter seventy-nine, Code of Virginia, relating to the practice of dentistry.

APPROVED MARCH 2, 1894.

1. Be it enacted by the General Assembly of Virginia, that sections one thousand seven hundred and sixty-nine and one thousand seven hundred and seventy-two of the Code of Virginia, and also sections one thousand seven hundred and sixty-seven and one thousand seven hundred and seventy-four of said Code, as amended and re-enacted by an act entitled an act to amend and re-enact sections one thousand seven hundred and sixty-seven and one thousand seven hundred and seventy-four, of chapter seventy-nine, Code of Virginia, relating to the practice of dentistry, be amended and re-enacted so as to read as follows:

SEC. 1767. *Who may Practice Dentistry.*—From and after the passage of this act, it shall be unlawful for any person to engage in the practice of dentistry in the Commonwealth of Virginia, or to assist in the practice of dentistry as either assistant or employee, or to receive license from any commissioner of revenue, unless such person has graduated and received a diploma from the faculty of a reputable institution where this specialty is taught, and chartered under the authority of some one of the United States, recognized as of good repute by the Board of Examiners, duly appointed under the provisions of section one thousand seven hundred and sixty-eight of this chapter, and shall have obtained a certificate from said Board of Examiners as provided in section one thousand seven hundred and sixty-nine of said chapter; provided, that persons who held license to practice dentistry in this Commonwealth on the twenty-eighth day of January, eighteen hundred and ninety, and have complied with the requirements of section one thousand seven hundred and seventy-four, shall be otherwise exempt from the provisions of this section; and provided further, that nothing contained in this section shall prevent any authorized physician or surgeon, or other person, from extracting teeth for any one suffering from toothache.

SEC. 1769. *Their Duties.*—It shall be the duty of this Board—

*First.* MEETINGS.—To meet annually at the time and place of meeting of the Virginia State Dental Association, or at such other time and place as the Board shall agree upon, to conduct the examination of applicants. They shall also meet for the same purpose at the call of any four members of the Board, at such time and place as may be designated by said members. Thirty days' notice of the meetings shall be given by advertising in at least two of the daily papers published in the State.

*Second.* EXAMINATIONS OF APPLICANTS, ETC.—To grant a certificate of ability to practice dentistry to all applicants who undergo a satisfactory examination, and receive at least four affirmative votes, which certificates shall be signed by the members of the Board, and be stamped with a suitable seal (which they may adopt).

*Third.* REGISTRY.—To keep a book in which shall be registered the name and qualification (as far as practicable) of every person to whom such certificate is granted.

*Fourth.* TEMPORARY CERTIFICATES.—Any member of the Board designated by the President thereof, may, upon presentation by any applicant of the evidence of the necessary qualifications to practice dentistry under this chapter, grant a temporary license to practice until the next meeting of the Board, and no longer; provided, that no such temporary license shall be granted to any person who has been rejected on an examination by the Board. All such temporary licenses shall be signed by the Secretary of the Board.

SEC. 1772. *Penalties.*—Any person who shall, in violation of this chapter practice dentistry in this State, shall, on conviction thereof, be fined not less than fifty, nor more than two hundred dollars, and shall not be entitled to any fee for services rendered, and if a fee shall have been paid, the patient may recover back the same. On the trial of any person charged with the violation of any of the provisions of this chapter, it shall be incumbent on the defendant to show that he has authority under the law to practice dentistry in this State in order to relieve himself from the penalties herein prescribed.

Any commissioner of the revenue who shall, in violation of section seventeen hundred and sixty-seven, issue a license to any person not authorized to practice dentistry by this chapter, shall, upon conviction thereof, be fined not less than twenty, nor more than fifty dollars, and no license issued by any commissioner in violation of this chapter shall be valid.

SEC. 1774. *Dentists Required to Register.*—Every person practicing dentistry in the Commonwealth of Virginia, at the time of the passage of this Act, shall register his name and post-office address, together with the name of the college from which he is a graduate, or the length of time he has been practicing in this Commonwealth, with the Board of Examiners before renewing his license, and it shall be the duty of the Board to issue to each person so registered, a certificate of registration, stamped with the seal of the Board, but no fee shall be collected from persons so registering.

Every person holding a certificate of qualification or registration from the Board of Examiners at the time of the passage of this Act, shall, within sixty days therefrom, have his certificate recorded in the clerk's office of the county or corporation court of every county or city in which he proposes to practice, and if in the city of Richmond, in the office of the clerk of the Chancery Court of said city, and every person who shall, after the passage of said Act, obtain such certificate from the Board, shall have said certificate recorded in the same manner within sixty days after receiving the same, and before receiving a license from any commissioner of the revenue.

The certificate shall be recorded in a book to be kept for the purpose, and properly indexed.

The clerk's fee for recording such a certificate shall be fifty cents.

This Act shall be in force from its passage.

A Copy. J. BELL BIGGER,
*Clerk of House of Delegates,*
*March 7, 1894.* *and Keeper of the Rolls of Va.*

# SELECTIONS.

## The Tongue in Disease.

Dr. F. L. Gerald in *Herald of Health* says: The tongue is of great diagnostic value and by close observation it will give us valuable aid in determining the character of disease. The tongue tells us of the condition of the blood, the condition of the nervous system, and the functions of nutrition and excretion. As these are important things to know, in fact just what we want to know, we will make the tongue talk as plainly as possible. We find the expression of disease in its form, its condition ot dryness or moisture, its coatings and colors. Change in form is expressive of disease. The elongated and pointed tongue indicates a condition of irritation and determination of blood to the stomach and bowels, and it is safe to give it full weight, and be careful in the administration of remedies.

As it is associated with excitation of the nerve centers, this evidence is valuable with reference to the stomach and bowels. If we observe this change of form at first, we not only anticipate unpleasant gastric irritation during the sickness, but it puts us on our guard against using anything that will irritate the stomach and bowels. The full tongue, broad and thick, is evidence of atony, want of action in the digestive tract. In this case the stomach will bear cathartics in mild form without danger. The dry, pinched tongue expresses a want of functional activity in the digestive organs. It is the tongue of acute disease, and is usually associated with dryness. While it is one of the indications for food, we must be very careful in its selection, giving small quantities at a time, and in a warm liquid form.

The fissured tongue in chronic disease indicates inflammatory action of the kidneys. The fissured tongue in advanced stages of acute disease refers us to lesions of the kidneys, or irritation of the nerve centers. In many cases we find a wrong in the secretion of urine. It deserves close attention and means to put the skin in better condition, and allay irritation of the nerve centers. Dryness and moisture are important evidence of the condition of the digestive organs. If the tongue is dry we are sure the stomach and intestines can do but little digestive work. It is absurd to employ cathartics in such cases unless the object is simply to remove irritating matter. In acute disease with dryness of tongue, when we find it becoming moist, we are confident of improvement, and it is nearly always looked upon as a favorable symptom.

The thin, transparent coating of the tongue gives evidence of enfeebled digestion, frequently from intemperate eating and drinking.

A heavily-loaded tongue at the base calls attention to accumulations in the stomach, and suggests the use of an emetic. The broad, pallid tongue gives evidence of a want of the alkaline elements of the blood. It may be the basis of the entirety of the disease, which will fade away as soon as the proper alkali is given, or it may be but a portion of the wrong, and the alkaline salt prepares the way and facilitates the action of other remedies. The deep red tongue, generally dry, indicates an acid. A dirty white, or dirty gray tongue means antiseptics.

While dryness always indicates excitement of the nerve centers and calls for sedatives, too much moisture and relaxation is evidence of the opposite condition.—*The Medical Brief.*

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NOT long since a vicinity news correspondent of a Rochester paper reported a case of "bled-to-death from tooth extraction," and thus set the fidgety patient by the ears. Hoping for an item we wrote an esteemed member of the VIIth District Society, resident in the village near which the case had been located, and got for answer the following:

"In regard to the so-called 'bled-to-death' case, I have made inquiry of the attending physician and he gives me the following facts. This case was a pure and simple case of 'Purpura Hemorrhagica,' and had no particular dental relation other than that he bled from the mucous membrane of the mouth. He also bled from the nose and likewise from the bowels, but his final hemorrhage was in the brain. His physician tells me it was a constitutional case; that he had been called to see another patient and incidentally expressed the thought that the young man did not look well. He examined him and diagnosed the case at that time, putting him under treatment, but had little hopes from the first. This is all. It has no dental significance."

All of which goes to spoil another story.—*Odontographic Journal.*

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## Lawson Tait on Bacterial Pathology.

Mr. Lawson Tait is probably the most aggressive opponent of the germ theory of inflammation. He says that during his professional life he has learned and unlearned some four or five theories of inflammation, and predicts that the present prevalent theory—a phase of lunacy; coccophobia, he calls it—will soon go the way of the other theories.—*Medical Age.*

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## Cocaine Anæsthesia Rendered Harmless by the Addition of Trinitrine.

The author proposes the following formula in which trinitrine is introduced, with the effect of preventing the anæmia of the brain:

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| R. | Cocaine muriate............................ | xx centigrms. |
| | Alcohol. solution of trinitrine. 1 pr. ct. | x gtt. |
| | Distilled water................................ | x grms. |

Each cubic centimeter contains two centigrammes of cocaine and one drop of the trinitrine solution. Gauthier has used this formula for two years with great satisfaction.—(*Revue gen. de Clin. et de Ther., No.* 37, 1893.)

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It may not be generally known, but is nevertheless, a fact that **borax** will precipitate morphine from alkaline or slightly acid solution. The reaction has frequently been utilized by the writer in the assay of opium, etc. The precipitate is purer of a white color than it is when ammonia is the precipitant while the yield of crystals is fully as large.

## Chloroform Narcosis.

Resuscitation in chloroform narcosis has been accomplished by a new method devised by Maas, one of Kœnig's assistants, of Gottingen. In the first case the ordinary means of resuscitation had been tried for an hour without effect; respiration and pulse had entirely ceased. Maas then made rapid rhythmical compressions—120 per minute—of the cardiac region, whereupon the heart's action gradually increased and the patient recovered. A second severe case responded with the same result to the treatment. Maas ascribes the effect of the cardiac compressions to the driving of the blood into the larger arteries.—*Medical and Surgical Reporter.*

## The Semi-Centennial of the Discovery of Anæsthesia.

We call special attention to the following from the editorial pages of the Buffalo *Dental Practitioner and Advertiser:*

The year 1844 gave to surgery one of the greatest boons ever conferred upon suffering humanity. The discovery of anæsthesia marked a distinct era, and the credit of it, by universal consent, belongs to dentistry. As in the case of all other great discoveries, a number have claimed to originate it, but the consensus of opinion has awarded to the dentist, Horace Wells, of Hartford, Conn., the honor of first demonstrating it, and his name is enrolled among those highest in the temple of fame as being one of the greatest benefactors of any age. This is the semi-centennial year of its discovery, and dentistry should not miss the opportunity of reminding the world of the debt which it owes to a member of the young profession. Dentists themselves use anæsthetic agents largely in their practice, and they would be recreant to duty and prove themselves but ingrates if they did not in some way mark the occasion by a fitting observance of the anniversary.

The Odontological Society of Pennsylvania took action early in the year, by appointing a committee to take the matter into consideration. The Dental Society of the State of New York, at its annual meeting early in May, appointed a committee to take action upon the part of the dentists of the State. The Connecticut State Dental Society, at its annual meeting, passed resolutions and appointed a committee to arrange a semi-centennial celebration, and other societies will doubtless take similar action.

But the subject is too great and too comprehensive in interest to be monopolized by any single body of men. Every dentist throughout the world is concerned in the matter, and should have an opportunity in some way to assist in celebrating an event that must be to him a matter of personal pride. But the time is limited, and whatever is to be done must be done quickly. Half the year has flown without any general organization having been effected, and unless immediate action be taken the most momentous event in our professional history will not receive the attention which its importance demands.

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## Potassium Permanganate in Morphine Poisoning.

Recently opportunity was met with of trying permanganate of potash in a case of morphine poisoning. The patient had swallowed about 60 grains of morphine. The morphine had twelve minutes the start of the antidote. There was only slight drowsiness, but at times threatened narcosis. Ten grains of permanganate was administered in a small glassful of water in three different doses within an hour, using in all about thirty grains of the permanganate, without the least unfavorable effect from its use. In ten hours from the time the morphine was taken, the patient was well. He had no griping, no headache or distress of any kind from the time the antidote was administered until he had entirely recovered from the slight drowsiness. For about an hour after swallowing the poison the patient was kept moving; then he was allowed to lie down and sleep without further trouble.—*Tri-State Medical Journal.*

## The Absorption of Odors by Milk.

Parville relates some interesting facts upon this subject. If a can of milk is placed near an open vessel containing turpentine, the smell of turpentine is soon communicated to the milk. The same result occurs as regards tobacco, paraffin, asafœtida, camphor, and many other strong-smelling substances. Milk should also be kept at a distance from every volatile substance, and milk which has stood in sick chambers should never be drunk. The power of milk to disguise the taste of drugs—as potassium iodide, opium, salicylate, etc.—is well known.—*Gaillard's Med. Journal.*

## Patent Medicines.

A bill lately introduced into the legislature of Iowa provides that every manufacturer of a patent medicine sold in the State shall have printed on the bottle, package or wrapper, a correct statement of the ingredients in the medicine; and that no seller of drugs shall offer for sale such patent medicine unless the formula of their preparations is printed as described. The act covers manufacturers in Iowa, as well as out By its provision, if a manufacturer fails to comply with it, he cannot sell his medicine in Iowa. The penalty for violation, whether on the part of the retail drug-store keeper or the manufacturer, is punishable by a maximum fine of $100.00 or six months in the penitentiary.—*Sanitarian.*

## The Probable Origin of the Red Blood-Corpuscles.

The supply of red blood-corpuscles is apparently maintained from the nucleated red blood-cells of the bone marrow, the structure of which is described by Dr. Robert Muir and Dr. W. B. Drummond in the *Journal of Anatomy and Physiology.* In the marrow of man and other mammals the supporting stroma is very slender, and at the periphery it is arranged in one or two layers of connective-tissue corpuscles with fibrils between. From these layers delicate nucleated filaments press inward and are connected with the blood-vessels and fat cells. There are usually in the center of the marrow a single artery and a much larger vein. The branches of the artery terminate in what may be called arterial capillaries, and these empty into rather wide channels which may be termed venous capillaries, though they do not have a complete endothelial lining. The bulk of the bone marrow is composed of spherical, colorless, granulated marrow cells. There are also many nucleated cells containing hemoglobin, which are larger than red blood-corpuscles, and are termed erythroblasts. Giant cells are found with a single lobulated nucleus appearing as many in one focus of the microscope. As the parenchyma is nearly cut off from the venous blood, the circulation through the marrow must be slow. Dr. W. H. Howell, of Johns Hopkins University, maintains that the marrow cells are embryonic cells whose function is to multiply by division and become nucleated red blood-cells. During their successive divisions the cells become smaller and pass from the type of the marrow cell to that of the nucleated red blood-corpuscle. But Dr. Muir considers that the marrow cells are of the leucocyte order. The red corpuscles found in the marrow substance have probably just lost their nuclei. Nucleated red corpuscles are not found in normal blood, but after severe hemorrhage in the human subject and in animals they may appear in the general circulation, in which case they stain more deeply with methyl blue than the ordinary red blood-corpuscle. Dr. Muir concludes that the nucleated red cells of the bone marrow are probably in free communication with the blood stream, but normally do not enter it, being retained in position by mutual cohesiveness, even after they have lost their nuclei. In this position they gradually acquire the physical properties of the adult red blood-corpuscles, and then pass into the flowing current. He reasons that after severe hemorrhage there occurs a dilution of the blood, in respect to the red corpuscles, and therefore the corpuscles are loosened in the vascular channels of the bone marrow where they are normally closely packed, and thus the normally stationary red cells may pass into the general circulation. The richness of the blood in corpuscles may be looked upon as determining the stability of the cellular arrangement in the marrow. Poverty in blood-corpuscles may not only induce certain cells to enter the circulation, but also stimulate other cells to proliferate, as it is thoroughly well established that the multiplying cells become smaller and pass from the type of the marrow cells to that of the nucleated red blood-cell, which so closely resembles the red blood-corpuscles.—*N. Y. Med. Journal.*

## A Method of Using Cocaine for Local Anæsthesia.

Krogius (*Centralbl f. Chir.*) describes a new method of producing cocaine analgesia, which is based on the fact that when a solution of this agent is injected into the subcutaneous tissue near to a nerve trunk it causes loss of sensation over a large zone corresponding to the peripheral distribution of this nerve. In order to reach the selected nerve trunk with certainty, and to apply the cocaine to several of its branches at the same time, the author, in injecting the subcutaneous tissue, passes his needle across the long axis of the limb, and as the needle is thrust along, the solution is gradually discharged. An injection made in this way across the root of a finger will, in the course of ten minutes, result in the analgesia of the whole digit, not of the skin only, but also of the tendons, the periosteum, and all the deep structures. If one or two injections be made transversely near the wrist, a considerable extent of the palm of the hand may be thus rendered analgesic. The sensibility of the ulnar side of the hand as far as the roots of the last two fingers, may, it is stated, be abolished by injecting a solution of cocaine over the ulnar nerve at the back of the elbow. By injecting over both supraorbital notches, analgesia may be produced in the whole of the middle portion of the forehead. The analgesia caused by this method of using cocaine attains its greatest intensity and extent for five to ten minutes after the injection, and is maintained for a quarter of an hour or even longer. The author injects only a weak (two per cent.) solution of cocaine, and keeps the patient recumbent for at least a quarter of an hour after the operation. This method has been practiced with success at Helsingors in 200 minor operations, such as amputation of the fingers and toes, excision of palmar fascia, and phimosis.—*British Med. Journal.*

## Another Woman Honored.

Dr. Jessie M. Weston, one of the graduates of the Woman's Medical College of Philadelphia in 1893, has been elected to the medical staff of the Connecticut State Hospital for the Insane at Middletown, occupying the only medical position which the Nutmeg State government has thrown open to women.

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## Women as Sanitary Inspectors.

Dr. Moreau Morris, of the New York City Board of Health, is quoted in the New York *World* as having the utmost confidence in women of medical attainments as sanitary inspectors. Dr. Frances G. Deane has had two years' experience as a member of the sanitary corps, and Drs. Alice Mitchell and Helen Knight have recently been appointed to similar positions. Dr. Morris believes "that the fact of their being women will enable them to get into the homes of the poor where a man would be received with suspicion. The work that these women are engaged in is not the easiest, consisting as it does of a thorough canvass of the tenement houses in the district set apart for their work. They must visit every room, inspect sinks, peep into closets and climb innumerable stairs. Then, too, the people the sanitary physicians come in contact with are very apt to eye with displeasure the intrusion of strangers. On the whole, the work of the woman doctors of the Health Board is undeniably hard."

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## Rules Concerning What Patients Tell Experts.

The established rules of evidence, it is well known, exclude hearsay testimony. As a consequence, the physician who makes an examination, as an expert, for the purpose of giving testimony in a case, will not, as a general thing, be permitted to state what the patient told him in reference to the specific cause of the injury giving rise to the litigation. But there is another rule, which is just as well settled: the United States Circuit Court of Appeals holds, in the case of the Union Pacific Railway Company v. Novak, decided April 2, 1894, that the physician may testify to what the patient said in describing his bodily condition, and the character and manifestations of his pains, when such statements become necessary to enable the physician to give his opinion as an expert, on account of the latent nature of the facts to be proved by it. The action or non-action of the internal organs can not readily be seen. In such cases the statement of the injured party is ordinarily admissible, in order to enable the expert physician to determine the real nature of the trouble at the time of the examination.—*Journal of the American Medical Association.*

# EDITORIAL.

## A New Dental Journal.

There has just come to hand the Prospectus, of "The Dental Digest" a new Dental Journal, to be issued in the interests of the Dental Protective Association, and its ally, The Dental Protective Supply Company, both having headquarters in Chicago.

"The Dental Digest is not to be a rival of any of the journals now published, and will be unlike them in some important features."

The Digest will be under the control of Dr. J. N. Crouse, which is a sufficient guarantee of the propelling power behind and that will guide its destiny.

The Digest will be of interest to all the members of the Dental Protective Association.

## Mississippi Valley Dental Society.

The annual meeting of this, the oldest dental society in this country if not in the world, will be held in Cincinnati, March next.

The Executive Committee is at work to make it an occasion of great interest; and special effort will be made to have in attendance the largest possible number of the members of twenty-five years ago and before.

A historical sketch, especially of its earlier existence, will be given, with the object of presenting the steps of progress in the interest of the profession, which it has been instrumental in inaugurating and promoting. The labors of the early workers in the profession should not be forgotten; they will not, of course, in the minds of those who were participants; but those who have come on to the stage in recent years can only know of these things by written or verbal accounts.

It is earnestly to be hoped that there will be a large number present on that occasion; not only of the older members but the younger members, and, indeed, of those who have not been members as well; that all together may participate in the work and enjoyment of the occasion.

The precise date will be given in the programme in the near future.

## Bibliographical.

A Compend of Dental Prothesis and Metallurgy, by George W. Warren, D.D.S. with one hundred and twenty-nine illustrations.

This little work just issued from the press of P. Blakiston, Son & Co., has been prepared with special reference to the need of the dental student; and well does it fill the intention of its preparation. It presents the fundamental principles of dental mechanics, though brief, yet very direct, concise, and sufficiently full for the elementary work of the student. It covers the entire ground of prosthetic dentistry, and its study will enable the student to take up his initiative work with a good degree of efficiency, and well prepare him for the profitable study of more extensive works upon the subject. Such for example as: Richardson's Mechanical Dentistry, Evans' Crown and Bridgework, and the various works on Irregularities and their Correction.

In the cursory examination that we have made of the work, we will not venture a change in any particular, if the work is to be kept within its present compass. We can without qualification recommend it to the dental student and to the busy practitioner as well; to each it will serve as a book of reference that neither can well afford to be without.

This book must be returned to
the Dental Library by the last
date stamped below. It may
be renewed if there is no
reservation for it.

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